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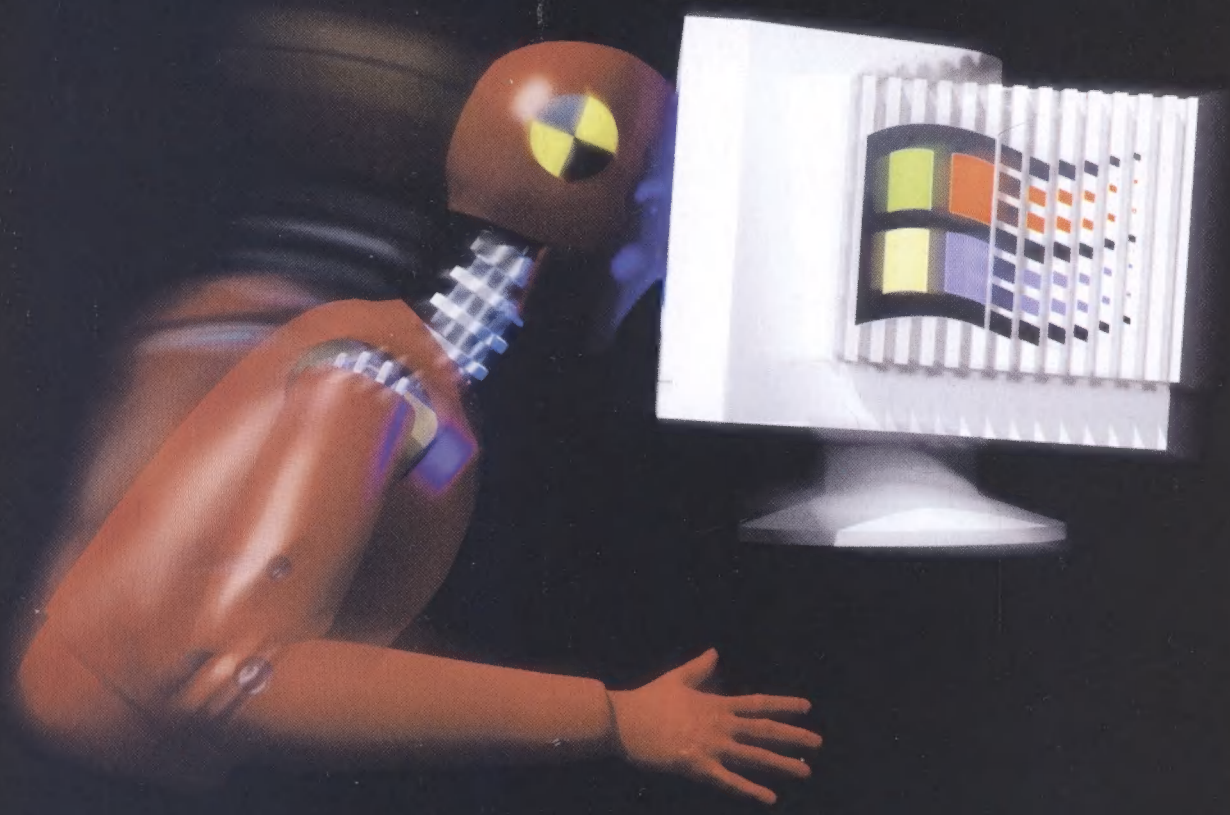

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Administration Tools	✓	✓	✓	✓
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Choice of Desktops	✓	✓	✗	✗
PartitionMagic™ Partitioning Tool	✓	✗	✗	✓
VMware™ Virtual Machine demo	✓	✗	✗	✗

Source: Respective competitors' web sites as of March 6/00

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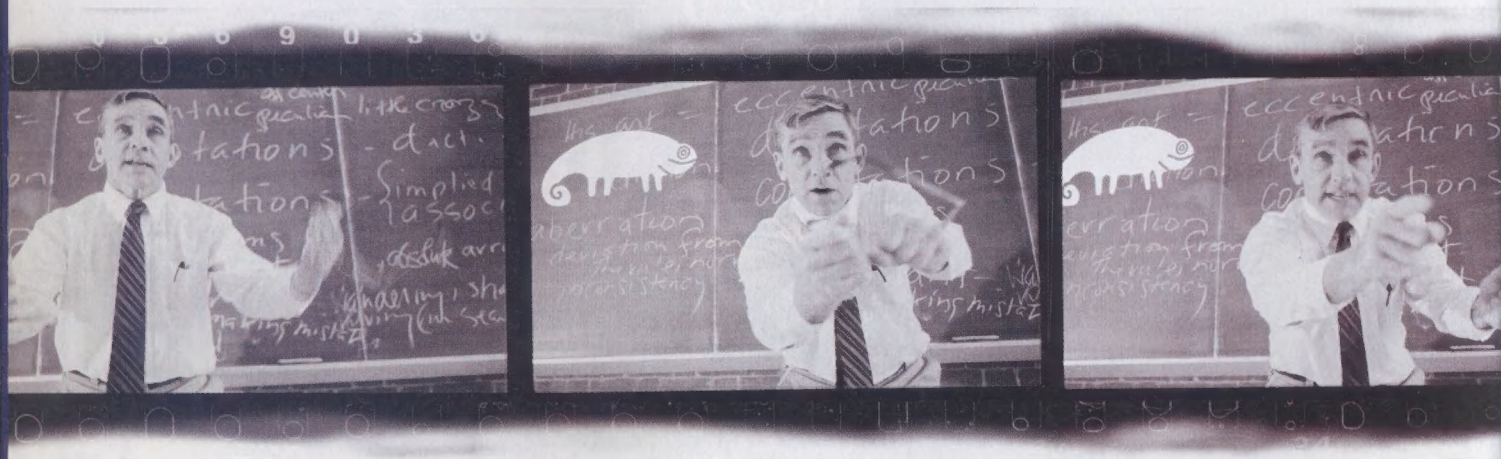

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39 Browser Bonanza

Finding the perfect Linux Web browser doesn't have to be a difficult task. We gathered up the best, reviewed the rest, and found all of the top multimedia plug-ins you'll need to install to get your Linux box rocking and rolling online.

50 Getting Enlightened About Enlightenment

If you're new to Linux, or are just interested in finding personal salvation, our in-depth escorted tour of Enlightenment will help fill your brain with bliss. From downloading the lastest versions, to installation tips and tweaks, we've got you–and your desktop–covered in grand style.

60 Mastering Perl

Perl has become the de facto standard glue language for Unix, and we've hired instructor Anders Brownworth to get you up to speed in writing your own Perl scripts. If you've never used Perl before, this is one lesson plan you definitely don't want to miss.

68 Penguin PDA Part Two

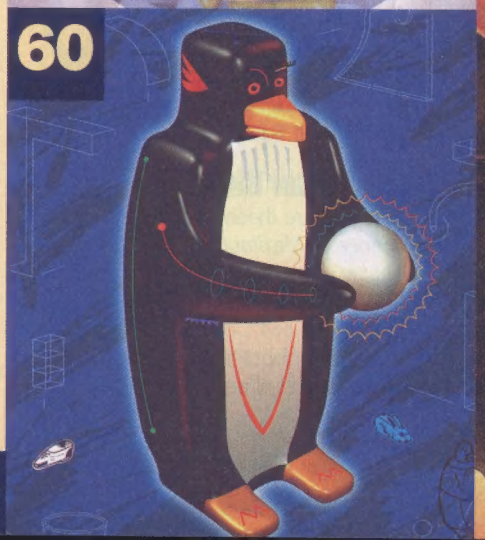
Listen up agents! We've scoured the planet to compile this briefing on connecting your favorite PDA to your favorite OS. From all of the Palm variations to pesky WinCE, we provide all the ammunition you'll ever need to achieve total mobile satisfaction.

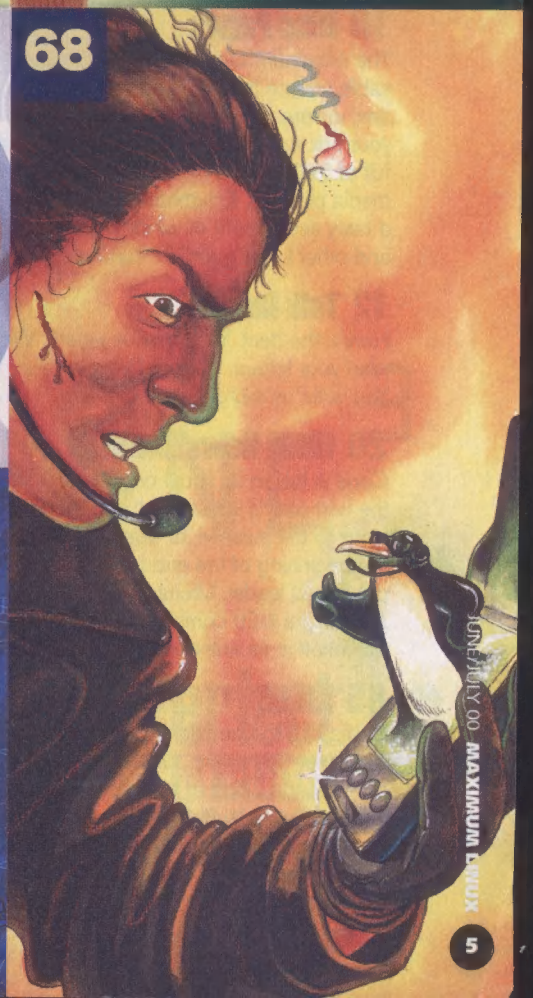
75 Penguin Got Game

Quake III: Arena is loads of fun to play, but setting up your own game server is where the excitement really begins. Michael Luton, our resident gaming guru, steps you through the process to get you up and running. Plus, he took time out of his busy work schedule to write a full review as well as tips on finding the perfect video card for your Linux box.

82 Linux Lowdown: LILO

Whatever the reason, the chances are high that you use multiple OSes. If you do, you'll need to choose your OS de jour using a boot manager. And, no, that's not someone who works in a shoe store!





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8 Ed Word
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10 Disc Pages
The *Maximum Linux* CD is your indispensable source for all the applications, utilities, drivers, and demos needed to make your box rock. This month's CD is chock full of 640MB of Web browsers, multimedia plug-ins, Enlightenment, Perl, and a tasty assortment of window managers and other Linux goodies. Yum!

12 Talk Back
Here's the deal. You write us letters. We read your letters. We print your letters. You write us more letters. Got it?

20 Linux News Channel
Corel is taking its show on the road. Will the company's latest products help bring Linux to the masses, or does this mark the beginning of the end for its much-publicized leader, Michael Cowpland? **Also**... The DOJ comes down hard on Microsoft in its anti-trust trial.

85 Alt.OS
Dedicated to true tales from the Linux front line. This month, Mae Ling Mak explores the world of Linux User Groups, and explains why going to a meeting may be the best thing that can happen to you.

86 Open Road
A new column about free software's assault on the high-tech world. It's also about the troops in the trenches–the coders and idealists behind Raymond, Torvalds, and Stallman–the ones you never hear about. This issue: FDL, *GNU Parted*, and *Bluefish*.

89 Love A LUG
With thousands of Linux User Groups around the world, we thought it would be sporting of us to include a few of 'em in every issue of the magazine.

90 Ask the Penguin
Got a problem with your Linux box? Never fear, the Penguin's here, and he's ready to solve all your most pressing Linux questions. This time out: choosing the right distribution, LILO, and *SendMail*.

92 Terminator
You know all those blue, underlined words in *Maximum Linux*? Hyperlink to this page to figure out what they mean.

93 Writer Bios
Just who are these people behind the scenes of *Maximum Linux*?

95 Rants and Raves
The mysterious Colonel X. This issue he's all fired up about VMware and Transmeta. If you haven't already, take cover!

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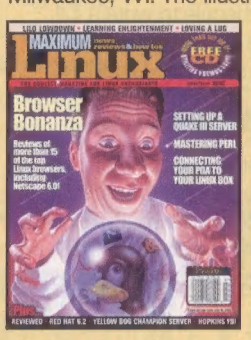
76 Quake III: Arena

About the cover:
This month's cover was rendered by self-taught airbrush artist James Shepherd of Milwaukee, WI. The illustration is one of James' first creations to utilize traditional techniques and combine them with digitial manipulation. Check out his other works at jamesshepherd.com.



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EdWord

Linux Still Has A Long Way To Go

I don't know about you, but I'm feeling pretty good these days. The first issue of *Maximum Linux* is flying off store shelves across the globe. The Department of Justice is demanding the breakup of Microsoft. Elian Gonzalez is back with his father where he belongs. *Fight Club* has finally been released on DVD. And Linux stocks have been hit hard by the roller coaster ride of Wall Street.

Of course, if you're one of the unlucky saps whose portfolio consists of only technology stocks, you might not be happy. After all, it's got to be mighty depressing to be sitting atop a pile of money one day, only to discover you're on the cold, concrete floor the next. When Linux stocks began taking the brunt of the beating a month or so ago, I must admit I sat back and let out a great big sigh of relief.

Not that I have anything against Linux companies, of course. I root for any and all Linux companies and products to become rousing successes. However, if there's one thing I hate in this world, it's propaganda. And, let's face it, Linux investors have been doling out a pretty big load of it over the course of the last year. Heck, Linux has had so much airtime recently that it's found its way into mainstream newspapers and family-oriented magazines, who are touting it like the second coming of Christ.

But now that 2000 is almost half gone, the new millennium (calendar debates aside) is quickly shaping up to be the year that Linux stocks were beat into submission. After posting meteoric gains throughout most of 1999, the majority of Linux companies have found their once-impressive stock prices falling lower than the neck line on Jennifer Lopez's dress. Does this come as a surprise to you? It doesn't to me.

I mean, let's take a look at the whole picture. When VA Linux hopped onto the IPO train last December, opening day trades skyrocketed, peaking at a staggering $239.25 per share. Shares the next day topped $320! Do the math: With 4.4 million shares outstanding, VA Linux shareholders effectively valued the company at a staggering 11 billion--not million--dollars.

Frankly, these types of valuations are absurd. Sure, VA Linux is a good company and offers great services to the Linux community. But it annoys me to think that the media's preoccupation with the latest "craze of the month", in this case Linux, has resulted in people thinking it's some sort of technology panacea. Yes, Linux is a cool OS, but let's face reality: These sorts of insane market conditions don't paint a clear picture of what Linux is all about, and they certainly don't address the immense obstacles that we have to surmount in order for Linux to survive.

Yes, I said survive. If there's one thing certain about the computer industry, it's that the best technology doesn't always win. Linux is a great OS, and appears poised for mainstream success, but there are never any guarantees.

Regardless of what happens up in Redmond, we can't sit around waiting for someone or something else to dictate what happens in the Linux community. Centralized kernel updates, USB support, simple installation routines, and elimination of all hardware incompatibilities are just a few of the many issues facing us right now. If we really want Linux to succeed and survive, we had better be focused on the things that matter, rather than the bullish market conditions. Too often we get caught up in the excitement, only to realize after the fact that we missed greater opportunities. Linux needs a lot more work–a whole lot more work–before any Linux company should be valued (mostly by ill-informed investors) anywhere near $11 billion dollars again.

Bryan Del Rizzo

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MAXIMUM Linux news reviews & how tos

June/July00 vol1 issue2

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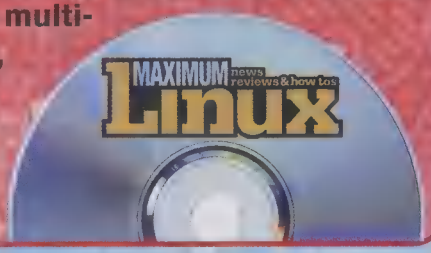
On The Disc: June/July 00

Wow! We spent days looking for the perfect mix of Linux apps and utilities to include on this month's disc and we think we found it! From the latest Web browsers to the greatest multimedia plug-ins, this is one disc that you won't be using as a coaster. Enjoy!



ActivePerl 5.6 *

Based on Perl 5.6, ActivePerl 5.6 is a significantly enhanced distribution as it encompasses the new features available in Perl 5.6. Debian and RPM versions are included.

Adobe Acrobat Reader 4.0.5

Adobe Acrobat Reader lets you view and print Portable Document Format (PDF) files. Acrobat Reader is in the standard gzip format.

Amaya 2.4 *

Amaya is W3C's Web browser/HTML editor. The RPM version is included.

AOL Instant Messenger 1.1.19

AOL Instant Messenger is an instant communication client for chatting on the Web. Included version is in the .sh format.

Bluefish 3.0 *

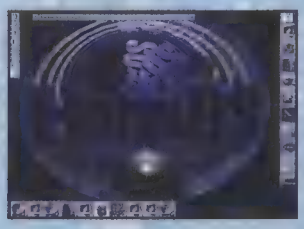
Bluefish is an HTML editor with a difference. We've included both the Debian and gzip formats.

Emacs/W3 *

Emacs/W3 is a full-featured browser, written entirely in Emacs-Lisp, and supports frames, tables, and stylesheets. The gzip file is included.

Enlightenment *

Enlightenment is a window manager for X. Versions on the disc are in gzip and RPM formats.



Express *

Express is billed as an Open Source browser written for the GNOME project. Express is included in gzip format only.

GNU Parted 1.0.13 *

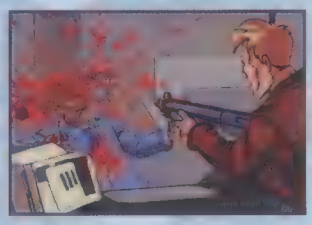
GNU Parted is a program that allows you to create, destroy, resize, move, and copy hard disk partitions. In gzip format.

Grail 06 *

Grail is an extensible Internet browser written entirely in the interpreted object-oriented programming language Python. Both Mac and Windows formats are included in .tgz format.

Hopkins FBI

Hopkins FBI is the lone game demo included on this months Maximum Linux disc. The standard gzip format is included.



IBM techexplorer 2.5.2

IBM's techexplorer is a plug-in for Netscape Navigator and Microsoft Internet Explorer. It's in the standard gzip format.

Microsoft Internet Explorer 5.01

No, we're not insane. We really did include it!

kfm/konqueror 2.1*

The K desktop environment file manager serves double duty as an HTML browser. This program is in the standard gzip format.

Lynx 2.8.3 *

Lynx is a speed demon of a text browser. Controls are intuitive and easy to use. This program is in the standard gzip format.

Macromedia Flash Player

Macromedia's Flash Player is a browser plug-in used to view Flash-enabled Web sites. A standard gzip file is included.

NCSA X-Mosaic 2.6 *

Mosaic is the granddaddy of Web Browsers. This dinosaur has been around since 1992 and hasn't been developed since 1997. We've included every current version of X-Mosaic just to show you how much we really like you.

Mozilla 6.8.6 *

Mozilla is an open-source Web browser, designed for standards compliance, performance, and portability. Included versions on the disc are Debian, basic i386, YellowDog, and Sparc.

MpegTV 1.1.1 *

MpegTV allows you to access streaming MPEG audio and video. Included versions are Debian, RPM, and .tgz.

Mpg123 .59 *

Mpg123 is a player for streaming MPEG audio. It includes codecs for MPEG layers 1, 2, and 3. In gzip format.

Netscape Communicator 4.72 and Beta 6 *

Netscape Communicator is included for your browsing pleasure. We also included Beta 6 for those of you who like to dabble with forthcoming software. Both are in gzip format.

Opera 4 PR3 *

Opera is a fully enabled Web browser. As noted by the version number, this is still an Alpha release. Gzip file format included.

Palm VII PQA for Maximum Linux *

The Maximum Linux Daily News PQA gives Palm VII owners wireless access to breaking news stories posted on the maximumlinux.com Web site. Simply load the file onto your Palm VII as you normally would, and stay up-to-date with all the breaking Linux news.

Perl 5.3 *

Perl has become the premier scripting language of the Web, as most CGI programs are written in Perl. However, Perl is widely used as a rapid prototyping language and a "glue" language that makes it possible for different systems to work well together. We've included the typical gzip format, as well as Windows and Unix versions.

Plugger 3.2 *

Plugger uses helper software (mpg123, mtv, TiMidity, etc.) to play various formats, including MPEG, AVI, QT, and WAV files. We scrounged up both the gzip and RPM versions for ya.

RealPlayer 7—Basic

Real Player Basic is a free program that allows you to view all types of Real media. Both RPM and non-RPM versions are included.

StarOffice 5.2

StarOffice is a powerful, cross-platform office productivity suite that delivers seamless access to applications and files. StarOffice is in basic .tar format and is usable with most flavors of Linux.

TiMidity++ *

TiMidity++ is a MIDI to WAVE converter and player. We've included the gzip file and the MIDI files for ya.

W3M 1.8 *

W3M is a text based browser similar to Lynx. Like Lynx, its extremely fast. Binaries are included.

WordPerfect 8

Corel WordPerfect 8 for Linux is an ideal office solution that delivers the same exceptional word-processing capabilities as the Windows version, plus many features available only for Linux. Standard gzip format.

X 6.4 *

The X Window System, known simply as "X", is a portable, network-transparent window system which runs on many different computers. Standard gzip format included.

XAnim 2.80.1 *

XAnim (pronounced: eks-'an-im) is a program for playing a wide variety of animation, audio and video formats on Unix X11 machines. In standard gzip format.

Xautoconfig 0.6 *

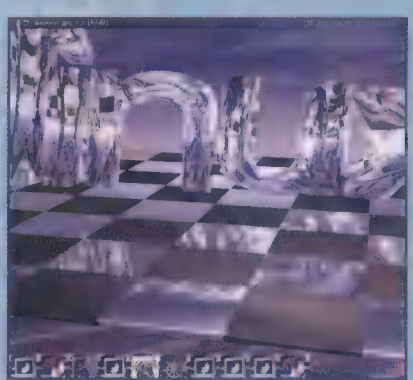
This program generates a XF86Config file based upon the current frambuffer device settings. RPM and gzip included.

XMMS 1.0.1 *

XMMS is an MP3 player that does just about everything that Winamp does. The gzip file is included.

Window Managers *

AfterStep 1.8.1
AmiWM 0.20
CTWM 3.5.2
FVWM 2.2.4
FVWM95 2.0.4
IceWM 1.0.3
MWM
OLVWM 4.2k
Sawmill 0.26
SCWM 0.99.6.1
VTWM 5.4.5a
WindowMaker
Wm2



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talkBACK

Okay folks. Listen up. This is how it works. We write and edit *Maximum Linux* magazine. You buy and read *Maximum Linux* magazine. You send us e-mail. We read e-mail. If we like your letter, you may see it printed here. If we like it a lot, you may even receive a cool *Maximum Linux* t-shirt. So, if you've got something you want to get off your chest, sit down in front of your Linux box and start typing away. Our mailbag address is editor@maximumlinux.com. Be sure to include your full name (that means first and last name) and your home town (please!). If you're really lucky, we'll respond to you personally, but due to the volume of mail received, we won't promise it! Besides, we'll be way too busy working our little fannies to the bone getting the next issue of the magazine out the door on time.

Colonel X is a Potty-Mouth

I like *Maximum Linux*. I subscribed within minutes of starting the premiere issue. Having now read through the first regular issue, I'm still pleased with the level and focus of the content. The one exception is Colonel X. What I read is a reflection of who I am. I should not have to worry about putting a computer magazine on the coffee table where a guest or a child might pick it up. A magazine about computers has no need for language such as "whiny bastard", "whup my ass" or "lame ass sequels." It is not just offensive. It cheapens the message that the author is attempting to communicate. The irreverent attitude of *Maximum Linux* can be a breath of fresh air, but the language of Colonel X gives it the odor of manure.

Ernie DeVries

OUR READER-OF-THE-MONTH AWARD goes to Tracy Martin, because we'll never be able to look at a conjunction in quite the same way again. Enjoy your t-shirt, Tracy!

Conjunction Junction, What's Your Function?

I think the material in *Maximum Linux* is great. I am relatively new to Linux, and I have learned more about Linux with both issues published so far. There are, however, three things I do not like about the magazine: The use of profanity, slang, and conjunctions. I do believe that the freedom of speech is important, but I also think that this freedom should be exercised responsibly. In my opinion, these issues show a high level of immaturity (profanity), a lack of professionalism (slang), and laziness or sloppiness (conjunctions) in the writing staff. I hope you will consider making the necessary changes to correct these three issues. Please do not take this the wrong way. I do not plan on canceling my subscription; I just think eliminating these three issues would make the magazine more suitable for a wider audience, like teenagers.

Tracy A. Martin

> "The irreverent attitude of Maximum Linux can be a breath of fresh air, but the language of Colonel X gives it the odor of manure."

Copy Editor Martha Sigwart responds: Any child who's reading *Maximum Linux* is certainly mature and advanced enough to have heard any language published here before and smart enough to know not to use it himself. Infrequent slang is a professional tool used to amuse MOST readers. (Has Ms. Martin read any e.e.cummings poetry or seen an episode of MTV's *Loveline* lately?) And I'm dying to know how she'd put together an entire magazine without any conjunctions. What's sloppy or lazy about a compound sentence? Readers: Any suggestions?

Masterpiece Theater

I must commend you on your masterpiece. Finally–a steady publication on an alternative OS. I'm new to the Linux arena and I actually bought *Maximum Linux* for the CDs, but got hooked on the magazine instead. I would like to learn all I can about Linus Torvalds' revolutionary brainchild. I also like the "no guff," irreverent stance you're taking. It's a great direction instead of the usual "just-plain-technical-droning" or the laughable fluff some magazines try to get away with.

Shane Chadwick

Maximum Linux: Traitors or Supporters?

I recently bought *Maximum Linux* and found it quite enjoyable. However, I was struck by how restrictive your license agreement for the CDs was. It seems to go against the GPL license that dominates in the Linux community. Section 2, especially, seems in direct violation of the license. Since the GPL states explicitly that, "You may not...distribute the Program except as expressly provided under this License," you seem to be in violation of this. I'm not a lawyer, and it's quite possible that I missed some nuance of your license. But as it is, it looks like it violates the GPL, which would prevent you from legally distributing some important programs like the kernel. Please inform if I am wrong.

Chris Gray

I am looking at your magazine in utter amazement. May I remind you that most, if not all, of the software on the free *Mandrake* and *Storm Linux* CDs are GPLed? What on God's green Earth is that awful, ugly, sorry excuse for a license doing on page 94? If I have one copy of *Storm* or *Mandrake* (or *Red Hat* or *Slackware*), I can make as many copies as I wish, and do with it as I please, and to hell with the license in the back of your magazine. If there are proprietary, non-free packages contained within the CDs, then there should be a differentiation of who owns what. A blanket boilerplate license such as the one printed is not only useless, it's completely against the entire spirit of the Open Source movement–which you seem to support.

Dan Podgurski

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Editor-in-Chief Bryan Del Rizzo replies: We received a number of letters from astute readers on this topic. Some were polite; others were extremely pointed in their criticisms. We fully understand the ramifications of the GPL license and agree wholeheartedly with its focus and principles. But if you read the entire disc license agreement, you'll notice that the preamble clearly states: *"The software, documentation, and other materials contained on the CD are being licensed to you pursuant to the conditions of this Limited License Agreement, subject to the rights of third parties under applicable intellectual property law or separate agreements distributed with the CD Contents. If there is a conflict between this Agreement and any Third Party Agreement, the Third Party Agreement shall prevail."*
The third party in this case would be the GPL. As such, you would be free to copy, redistribute, and use the contents of the CD however you wanted, as long as your actions adhered to the rules and regulations of the GPL.
Of course, this begs the question: If the Third Party Agreement always prevails, why do we need the license agreement in the first place? Well, for one, it covers any sort of editorial content, which isn't governed by the GPL. Second, it means that people can't dupe the CD, brand it as a *Maximum Linux CD*, and then sell it for profit at a flea market or someplace. Although the contents from the first CD were covered by the GPL, this may not be the case with every issue. What if we bundle some sort of commercial demo, application, or special editorial content that was written by a freelance writer? Clearly, these sorts of things can't be freely redistributed or sold for profit, and, as such, are protected under other agreements.

However, in accordance with the GPL license, we'll make sure to denote each program governed by the GPL on the disc card. That way, you'll know before you run the CD what content can be freely distributed and what can't. We forgot to do this in the first issue, but rest assured—we won't forget again. Of course, considering our subject matter, I'm guessing that the majority of the CD content will be freely redistributable.

I hope this all makes sense. And thanks to everyone who voiced their concerns. We really appreciate your integrity and your efforts to make sure everything we do adheres to the same spirit of the Open Source community.

> "A blanket boilerplate license such as the one printed is not only useless, it's completely against the entire spirit of the Open Source movement—which you seem to support."

No More Microsoft Bashing

I really enjoy your magazine. The content is balanced well, at least from the perspective of someone new to Linux. I was able to recompile the kernel successfully after reading your article, and I take that as a good sign. With all due respect to George Carless (*Talk Back, May/June 00*), I hope you do keep the new guy in mind and not make this an overly technical magazine. For those that require this level of technicality, there seem to be plenty of resources available already. I'm not an enemy of Microsoft, and do not consider all their OSes and software junk, but I would like to see Linux succeed because competition is good. When pushed against the wall, Microsoft will be forced to produce good products. I know that I will probably be flamed by more closed-minded readers, but let's face it—*Microsoft Word* kicks *WordPerfect's* butt because *WordPerfect* for Windows sucks!

John Couch

The Microsoft-bashing e-mails have got to stop. I dislike Microsoft products just as much as the next Linux user, but you really do have to weigh the options when you're dealing in the OS market. You print a lot of e-mails that bash Microsoft, but not one reader ever provides a valid reason why they pick Windows over Linux, or even why they pick Linux over Windows. You should start publishing only e-mails with purposes, or educate people on the reasons why Linux is better than Windows. I don't personally run Windows, but it does serve a good purpose in some situations.

Talk Back is awesome, but can you start printing reader tricks and tips, too?

Joseph McLeod

Editor-in-Chief Bryan Del Rizzo replies: What a great idea! Send your tips to editor@maximumlinux.com. If there's a good response, we'll print 'em every issue.

MSG Good, MSD Bad

On page 45 of your May/June issue, you state that there is no replacement for the MSD command line function. There is. It's called /proc (or KDE Control Center for KDE Users). There's more info there than there ever was in any version of MSD.

K B Ng, Kuala Lumpur

The Maze with No Escape

I enjoyed your magazine so much that I have read it five times already and just started the sixth go-around. While I was installing *Mandrake 7.0*, my son Quique, who is 7 years old, began reading your mag, too. He was puzzled with the maze you had on pages 58-59. He said there was no way the penguin in the center could get out. I thought that was odd, so I looked. He was right! The next time you put penguins in a maze, please don't trap them. Let them out.

Marcos Cartagena

Art Director Bob Roth replies: Actually, if you look closely, all the penguins can indeed get out. Because of the way the magazine is bound, the illustration's center is partially obscured. I'd never trap a penguin!

Supermarket Sweeps

I found your magazine at the grocery store in Parksville, British Columbia. What struck me was the first class printing and artwork. So many computer magazines today appear to be produced by computer people and not by publishing professionals. Yours was nice.

Shane Owen

Our UNIX guru at work was always singing the praises of Linux and trying to convert me. He set up our proxy server and Intranet server using a 166MHz Pentium and a copy of *Red Hat Linux*. I was very impressed, because this one server is used for all of our locations across North America for Internet access. I figured anything that powerful, flexible, and stable deserves a quick look.
The last place I would have expected to find a good source of Linux information was sitting in the magazine rack at my local supermarket. Go figure. I found yours to be a nice balance of newbie and guru information in a fun format. Keep up the excellent work!

Jupi Reitsema

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Frosty the Snowman

You have a great magazine, but I feel compelled to respond to a letter I read in your May/June issue. People are accustomed to easy installs of Windows, but when they try to install Linux, they hit a roadblock and give up. I, too, have hit these roadblocks and have banged my head against the wall. Here's my suggestion: Take a break, grab a frosty beverage, and continue on an hour later. If you can't figure out the problem on your own, then go surfing or ask a friend. You can learn a lot by figuring these problems out yourself. Maybe your Linux installation won't be as smooth as Windows, but at least you'll have an OS that doesn't crash every day.

Matt Ellison

> "The next time you put penguins in a maze, please don't trap them. Let them loose."

Linux Is For Losers Who Have Too Much Time On Their Hands

You and your readers seem to think Linux rocks, but what about the other 99.9999% of the population? Let me give you an example. To install Windows 95/98 you only have to:

1. Put in boot disk
2. Run fdisk
3. Format
4. Install
5. You are done.

Excluding IRQ conflicts and old non-PnP peripherals, you should have no problems. How do you expect me to even consider putting one of your CDs in my machine when on page 10 of your *Stormix 2000* install guide (*May/June 00*), you tell me I have to "Choose My Weapon"? What the hell is the difference between text and graphical installs? This article, your magazine, and Linux are crap to me. For someone who is used to the very friendly GUI of Windows, your magazine and CDs are garbage. You should explain what the hell you're talking about. I don't know a goddamn thing about Linux. That's why I purchased your magazine. Linux is still in its infancy, and it will never grow up unless the morons who design it make it a little less like total crap.

Thanks to you, I now have two new coasters.

Mike Brierley

Benchmark Backup

Here is a little informal benchmark that I found pretty impressive. I run Seti@home under Windows 98 and Red Hat Linux 6.2. I also installed the xsetiathome program to get the nice graphs under Linux that I have under Windows. What I found most surprising is that on the same machine, Seti@home processes data units 2.3 times faster under Linux than under Windows 98. I never realized just how bloated Windows really is.

David Richardson

Two Sides of the Coin

Games! Where are they? We want the games! RPGs. Military. Flight sims. Games of all types. We just want the games. Don't we? When it comes down to it, you know we do.

Laurence S. Batterson

I just subscribed to your magazine because I am currently doing some work with Linux. I am an independent contractor. I work mostly with Microsoft systems. I have trained with them, and I like many things about them. I try to keep my options open, however. I want to know as much as possible about many different environments because I believe this helps me maintain some competitive advantage.

Right now I am trying to create an integrated environment running *Red Hat Linux 6.0*, Solaris 8, and Windows NT. Shortly, I will also have Windows 2000 in the mix. My interests lie in using these systems in a real-world business environment. I would find an article about setting up and running Oracle on Linux of great help. I wanted to set up a dual boot system with Solaris and Linux, and I may yet do it. But I have learned that a Solaris partition looks to Linux like a Linux swap partition, and a Linux swap partition looks like another Solaris partition (slice) to Solaris. Any advice about mixing these two would be of help.

However, unlike some of your younger audience, I am 48 and not a game player.

I hope this gives you an idea about one of the audiences you need to satisfy in order to keep the subscriptions coming.

Henry J. Stock, Jr.

Apache Errata

I just remembered that while reading the Apache article, in the first paragraph the writer explicitly refers to Apache as a "browser". This is totally untrue, and could very well confuse newbies who may not know any better.

Brian K. Jones

Anders Brownworth, Chief Technical Editor, replies: Yeah. I'm a complete idiot. Apache is most definitely a server. I don't know what I was thinking!

Apache Errata Part Two

I am writing concerning the article on the Apache Web server. Your graphics person was using images from Anasazi & Mogollon sites, not Apache. The Apache didn't live in no stinkin' tract-home-like "cliff dwellings." Instead, the Apache were a cool group of folks freewheeling it on the plains & down into Mexico.

R. Joe Brandon

Art Director Bob Roth replies:
While it's probably true the Apache never actually occupied these cool digs, the cliff dwellings are one of the greatest monuments to Southwest Indian culture. The Anasazi, who abandoned these sites about 600 AD, are undoubtedly the ancestors of the present day Apache, Navajo, Zuni and Hopi people. Besides, I've got tons of these vacation photos I gotta use!

Linux: The New Religion

I just got into Linux about two weeks ago,and I have been scaling the Net high and low for a good resource. I've also gone around to practically every bookstore and found nothing. Until the day I went to a bookstore and there it was–*Maximum Linux*–glowing and shining.

As I took a look at it, I was struck with awe and I knelt down and thanked God. I have read it twice so far.

Thank you so much for publishing this sacred magazine.

Jeshua Nanthakumar

Direct from Cuba

I think you've got a hit on your hands. Keep up the great work. The only thing that irritated me was Aldo Cimino's lack of coverage of *XFCE*. It's an excellent desktop

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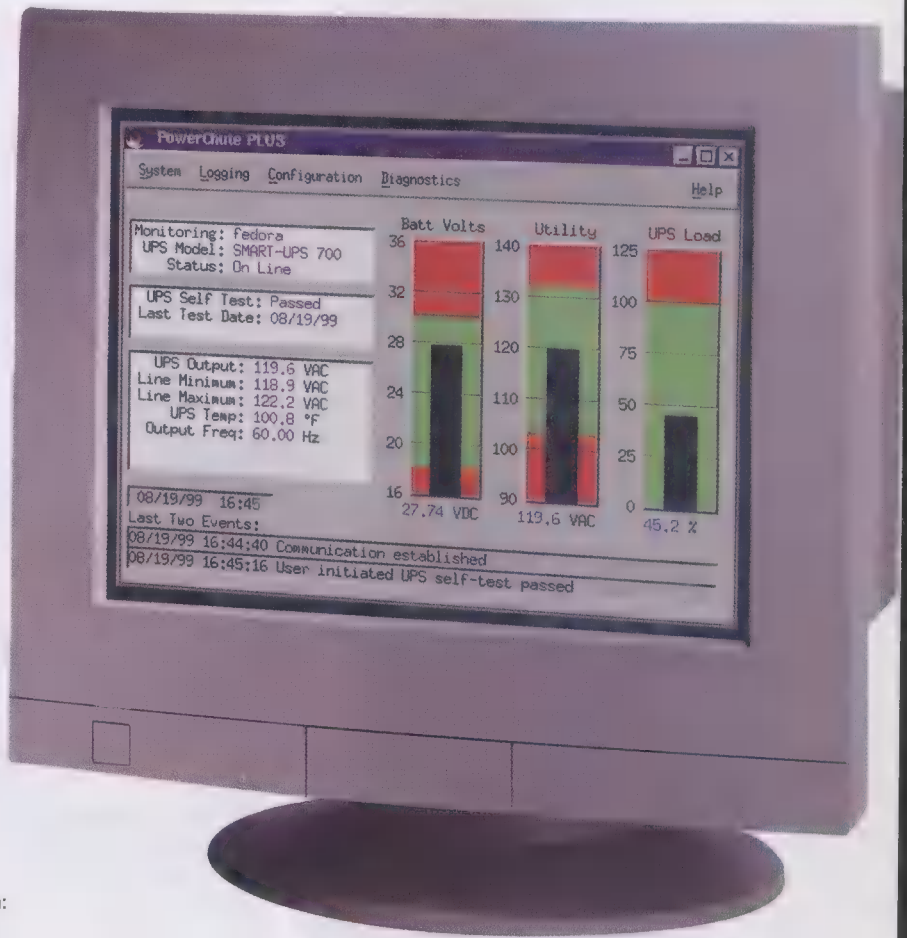

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environment that blows KDE and GNOME off the desktop. Plus, its author, Olivier Fourdan, is tres cool. How about some coverage?

Thomas A. Gilchrist, Guantanamo Bay

Contributing Editor Aldo Cimino replies: Although the cover of the first issue intimated that my article was about "Choosing the Winning GUI for You," it was more about getting acclimated to two popular desktop environments, KDE and GNOME. Thus, my "coverage" of other desktop environments and window managers was brief, at best. Expect future articles in *Maximum Linux* to pick up where I left off.

I decided not to list *XFCE* because its presence begged a question. I could not, in good conscience, put it among other window managers since *XFCE* is more than that: It's really a desktop environment. However, if I recognized this, I would be left explaining why it wasn't put with KDE and GNOME—something I felt would be redundant and require that I restate points already addressed earlier in the article. Simply put, the piece was primarily about pimpin' KDE and GNOME.

Military Intelligence

Dear Colonel X:

Having read your Rants and Raves article in the second issue of *Maximum Linux*, I'll have to say I agree with you on both the pros and cons of "the Movement." I like Linux. I like Windows 2000. I spend way too much time defending both from their respective critics.

Now, my question is: At the end of your article, it says that you were a Navy Seal, and, in addition to Linux, specialized in PsyOps. You Navy guys put an 's' after it? I had Drill Sergeants who would rip our Army tongues out if we dared add that letter to the end of PsyOp, as we knew it.

Oh well! Go bust ■ few heads of fanatics of both sides of the OS fence.

SPC Meister
2nd Psychological Operations Group HHC

It's Not the New Millennium

Sigh. "We produced the first issue of Maximum Linux late last century." I guess the issue I found on the stands had a typo on the date then, because it says it was published in the next-to-the-last year of the twentieth century, 1999. I did thoroughly enjoy that issue, and subsequently subscribed, and have been anxiously waiting for the next one.

It's too bad about the error in the opening editorial. I'll optimistically assume that no other inaccuracies crept into the issue. Calendar misunderstanding aside, though, keep up the good work.

Patrick Sweeney

Give Abraham His Due

I let my subs to *PC Magazine* and *PC World* run out because I was tired of the same old thing. Then I saw the second issue of your magazine and subscribed. But you have made a serious error in judgement. You gave Abraham Chapman your reader-of-the-month award, but then you only sent him a t-shirt? This kid is searching all over for your magazine. Why didn't you give him a free subscription?

Terry Gowett

> "Linux is still in its infancy, and it will never grow up unless the morons who design it make it a little less like total crap."

Penguin Briefs

Where do I get a pair of those funky penguin boxer shorts featured on page 23 of your May/June issue? I think my girlfriend would love them!

Rene Maurice

Copy Editor Martha Sigwart replies: Visit www.linuxmall.com for those penguin undies and other goodies.

Mae Ling Fan Club

Mae Ling Mak looks just persuasive enough in her column that I'm sure many of the young single programmer types must be flooding your e-mail servers complying with her request to be "shown the code!" Watch out, Sherry Monarko! I bet she'll be giving ya' a run for your money for Maximum Babe!

Ted Thomas

Evan Eveland Fan Club

I just wanted to let you know that you're doing an excellent job with this magazine. It's technical enough that it keeps me wanting more, yet simple enough that my soon-to-be-Linux-using wife can follow it. I especially liked the "Setting Up Apache" story. I've been looking for a story like that for a while. The article on the command line interface is the kind of story that can help people like my wife a little more. I do believe that I'll be subscribing. Well, my wife will be doing the subscribing, since she doesn't let me use the credit card anymore (not since that incident with *Dr. Who* and the PBS fundraiser).

On another note, it's nice to see that you let someone of Evan Eveland's caliber write for your magazine. He may be silly and ignorant, but he's got guts. He's also an old friend of mine, and he really knows his stuff. Maybe I'll drop him a line and let him know what I thought. Or maybe not.

Bob Puckett

Dave Reynolds Fan Club

I very much appreciate the article on Linux for PPC. Dave Reynolds is a great editor and writer. As ■ Mac user, I find that Linux software development is all too often Pentium-oriented. Don't forget us.

The magazine content is great. A suggestion about the CDs. Try to make one more like MacAddicts, fun and oriented to the content of the magazine. Really good how-tos (your print articles are excellent), Kernel Source, and patches, along with some demos and neat software packages. The distributions may be cool for some, but we PPC users have no use for them, although I have installed both *Mandrake* versions from your magazine on others PCs. (I have also put them on my "Virtual PC" to learn about them.)

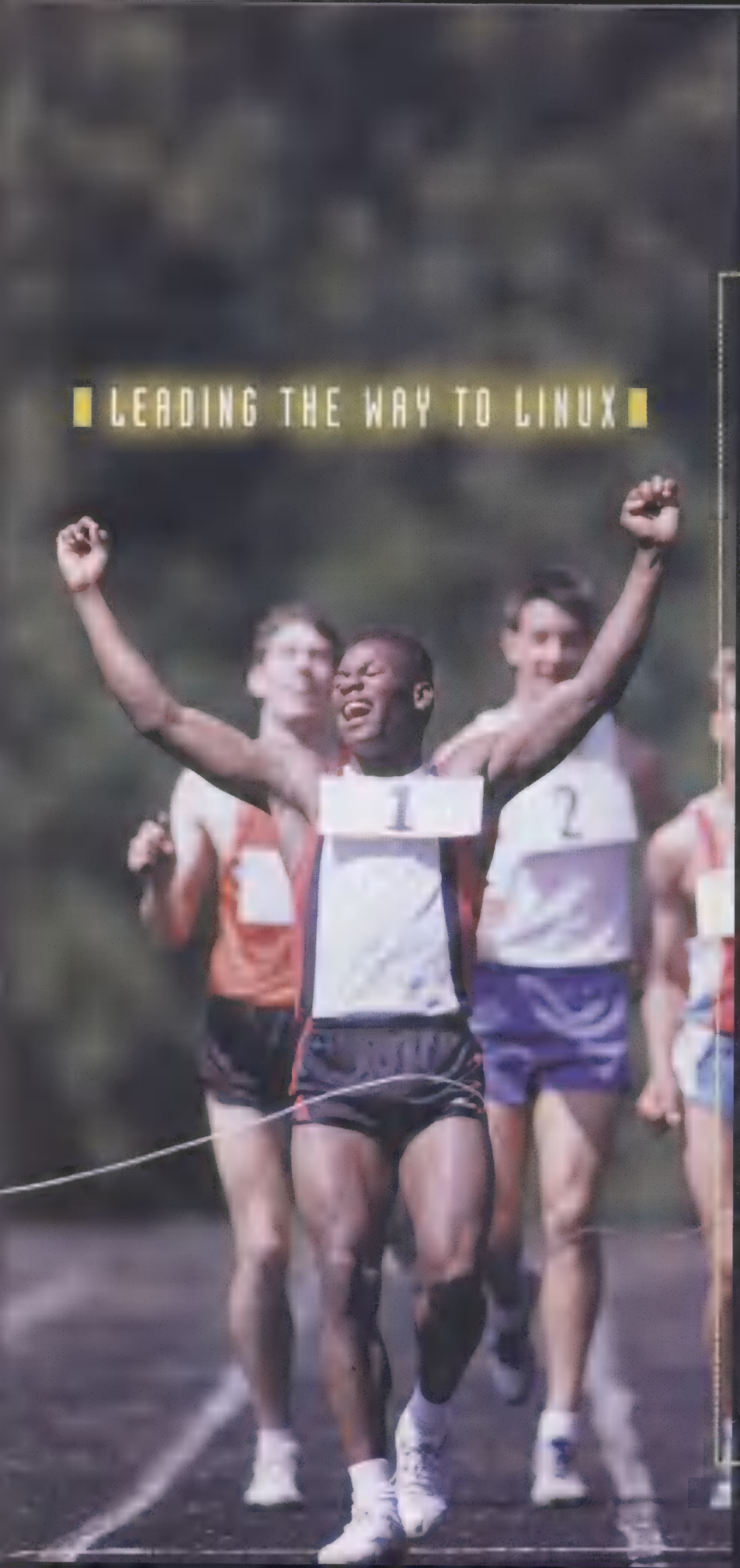
You folks seem to have a great attitude, like your compatriots at MacAddict (as opposed to the stiff superiority complex attitude at Maximum PC). Keep up the good work.

Rick Sheridan

Cut, Copy, Paste

In the May/June 00 issue of *Maximum Linux*, David Reynolds mistakenly wrote that *Yellow Dog Linux* is not available for download. He was wrong. Dead wrong. In fact, you can download it from ftp.yellowdoglinux.com.

Also, on page 45 of the *Taking Command of your Linux Box* feature, we said that *PKZIP* is now dubbed *WinZip*. Although both are compression utilities, they are unrelated.



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Corel Rolls into Town

Year of the desktop starts with a bang

Without doubt, this is the year of the desktop. While legal forces were gathering to loosen Microsoft's stranglehold, its major competitor in office applications unleashed a 12-city road tour to American and Canadian fans eager for the first glimpse of WordPerfect Office 2000 for Linux. Calling the release a "turning point in making Linux a reality on the desktop," Dr. Michael Cowpland, Corel's president and CEO, said the release fulfilled his promise to provide world-class (i.e., as good as Microsoft) applications for Linux.

While Corel's entrance and its products have been greeted with raised eyebrows by Linux veterans, Windows users now moving over to Linux are bound to find Corel's presence comforting and empowering. Corel has always sweetened the deal with dozens of fonts and nifty utilities, and *WordPerfect Office 2000* for Linux is no exception. For example, the $159 *Deluxe Edition* adds the enhanced download edition of *Corel LINUX OS*, the *Paradox 9* database, *Netscape Communicator*, 1,000 fonts, over 12,000 clipart images, over 200 photos, and a bean-filled penguin to keep you company while you pore through the manuals.

Illustration by Scott Peck.

These are applications with a significant user history. Thousands of legal offices around the world have standardized on *WordPerfect* since the dawn of time (i.e., DOS). *Paradox* and *Quattro Pro* went head-to-head with Ashton-Tate's *dBase* and many innovative spreadsheets, which have unfortunately disappeared over the years. They have already proven themselves as accessible, practical solutions to business problems. And their arrival among the penguins means that millions of users will now look upon Linux as a serious alternative desktop.

WordPerfect Office is to be followed throughout the year by further Linux ports of Corel products. *Corel Photo-Paint 9* will be available as a free download in June. *CorelDRAW Graphics Suite* will arrive in July. Other additions to the Linux lineup will be *FLOW!*, a professional diagramming application, and IMSI's project planner, *TurboProject*. By year's end, Corel's *Ventura Publisher 8.5* for Linux will arrive, including new XML features. (XML is already built into WordPerfect 9.) Cowpland expects his *Paradox* database to be used eventually as an XML repository, providing a medium-scale solution for under 100 users when Oracle and DB2 are too expensive.

In typical Cowpland style, Corel has been actively building new partnerships and alliances to enhance its Linux initiatives. It spun off its nifty NetWinder Linux appliance to Rebel.com, but retained 25% of the new company. In January, Corel took 30% of OE/ONE.com (www.oeone.com), a manufacturer of a Linux "Web appliance" founded by a former Corel executive. The market for Web appliances is expected to reach $15 billion in the next two years.

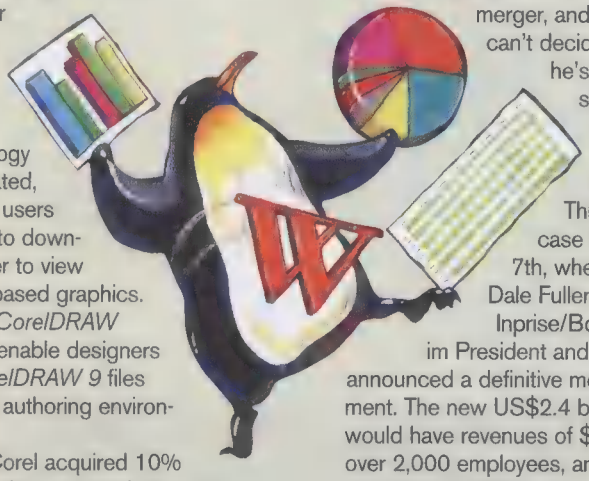
Like Cowpland's tennis matches, this back-and-forth pattern was repeated in 1998, when Corel sold its jBridge software for a 20% stage in GraphOn (www.graphon.com), then last year agreed to integrate GraphOn's award-winning thin-client *Bridges* software, which provides access to any application, from any desktop or display device, over any type of connection, Web-enabling Windows, UNIX, and Linux applications without requiring modification of the software.

In December, Corel announced a partnership with S3's Professional Graphics Division to develop a new 2D Linux driver for the Diamond Fire GL series of graphics accelerators (www.firegl.com). (S3 has now transferred its graphics chip business to a newly established joint venture between VIA Technologies and S3.) A 3D driver for the Fire GL1 accelerator will be bundled with an upcoming release of *Corel LINUX OS*. Also last December, Corel acquired one-third of LinuxForce (www.linuxforce.net/), a Linux service and support organization based in Philadelphia, PA. LinuxForce specializes in supporting *Debian Linux* on which *Corel*

LINUX OS is based.

In January, Corel announced it will acquire up to 30% of Newlix, an Ottawa-based startup which, like Rebel.com, produces a small office Linux server delivering all the functionality of big business networks, at a fraction of the cost. Based on Corel's *LINUX OS*, Newlix offers its software separately, or pre-installed on its Omega servers.

In February, Corel licensed Macromedia's popular Flash Player technology for *Corel LINUX* and *Corel DRAW 9*. Because Flash technology will be integrated, *Corel LINUX* users will not need to download the player to view Flash vector-based graphics. A new utility, *CorelDRAW Exporter*, will enable designers to export *CorelDRAW 9* files into the Flash authoring environment.



Recently, Corel acquired 10% of Simply.com Inc., a manufacturer of videoconference solutions. Corel will integrate Simply.com videoconferencing technology into future releases of *Corel LINUX*. But not all the action was with Linux. Several leading graphics products for Windows and the Macintosh were acquired from MetaCreations–*MetaCreations Painter*, *Natural Media* (a point program), *Kai's Power Tools*, and *KPT Vector Effects* (plug-ins for *Adobe Photoshop* and *Adobe Illustrator*), and *Bryce* (3D landscape creation and animation software).

But even though it ended the millennium with a surprise profit, Corel has lost money in more quarters than it has gained. But if early sales of Corel's Linux products are any indication, Cowpland's strategy is correct: after just three weeks in stores, Corel earned $3.2 million in sales.

Trouble lurks ahead

However, as we go to press, Cowpland faces two troublesome challenges. In 1997, he and four other Corel executives decided to sell some of their stock options, just weeks before the company reported the largest loss of its history. The other executives were never charged. One pointed out that their stock options were about to expire and become worthless. But Cowpland's case has dragged through the Canadian courts, threatening him with a huge fine and up to two years in jail. Observers doubt the charges will stick; there are few precedents in Canadian law. But the mere suggestion of impropriety must have had some impact on the second of Cowpland's problems.

You'll have noticed the pattern: Cowpland announces a merger, and observers can't decide whether he's rushing into something or running away from something. This was the case on February 7th, when he and Dale Fuller, Inprise/Borland's interim President and CEO, announced a definitive merger agreement. The new US$2.4 billion Corel would have revenues of $418 million, over 2,000 employees, and a presence in over 100 countries. Its product line would embrace matching products for all of Microsoft's catalog, all the way from word processors to operating systems and programming tools. Even Microsoft would benefit from the deal, due to $25 million of Inprise stock it acquired as part of a patent dispute.

"Is this merely two companies so battered by Microsoft that they're rushing into each other's arms in hopes of propping each other up?" asked Charles Babcock in Inter@active Week.

With the stock prices of both companies sinking, the thought obviously occurred to some Inprise shareholders, who sued the company for undervaluing their shares in the deal. Late in April, Corel informed the Canadian Securities and Exchange Commission that if the deal did not proceed, it could run out of cash within 90 days. Financial media were quick to jump on the statement as an admission of desperation, but it was made as part of a required worst-case scenario in Corel's filing. Either in reaction to this, and/or to satisfy its cranky shareholders, Inprise asked an investment bank to evaluate the fairness of the deal.

Cowpland's Past is Prologue

Anyone attempting to take the tenor of these Corelian times must understand Cowpland's history, and why none of the above should come as a surprise. The key words are sport and metamorphosis. Cowpland emigrated from England to Canada in 1964, arriving with a Bachelor of Science from Imperial College. He completed a Master's and a Doctorate in electrical engineering from Carelton University in Ottawa while serving as a wage slave at Bell Northern Research. After managing chip designs at MicroSystems International, he co-founded MITEL in 1972. Riding this early wave of high-

⏭ p. 22

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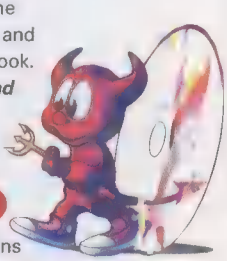

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Corel continued

tech as CEO of the new company, Cowpland achieved a 100% annual growth rate for ten years, becoming a leader in telephony. In 1984, British Telecom acquired the company, and Cowpland jumped into a second high-tech wave by founding Corel the following year. By 1989, Corel was riding high on the success of *CorelDRAW*, which quickly became the leading graphics application for the PC. By 1996, he acquired the *WordPerfect* family of products from Novell, setting up Corel as the only company which might match *Microsoft Office*.

The good Doctor is a Wimbledon-class tennis champion, and a Black Belt. His flamboyant life has been chronicled in Ross Laver's book, *Random Excess, the Wild Ride of Michael Cowpland and Corel*, and, together with his equally flamboyant wife Marlen, the couple appear to provide a good portion of the social gossip diet in the Canadian capital. His critics say he owes allegiances neither to people nor products. The steady stream of ex-employees who attended "Corel University" (by all reports a school of hard knocks) has even resulted in a Web site for Corel alumni.

It's clear that anyone joining Cowpland in a venture will enjoy few dull days. At each turn, he's parlayed a fundamental technology into a successful corporation, taken his profits, and leaped on the next generation of technology, once he figured out what that was. Where Microsoft's Steve Ballmer is a master sales manager, Michael Cowpland is a sports champion, and his best game is high-tech ventures. Like Microsoft, Corel has had its full share of product failures.

But unlike Microsoft, whose game is inexorably coming into the station, Corel's Linux strategy could produce a bullet train to the future, bringing with it a wealth of riches and successes. Or, the whole entire strategy could derail not only himself, but his company too, bringing an end to what many have deemed a "fairytale of a story."

Only time will tell.

–Reported by Malcolm Dean

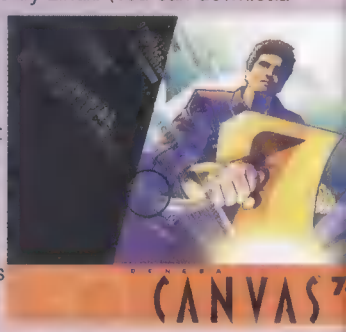
NetWinder Primer

NetWinder is the reason for Corel's sudden entrance into the Linux market. In 1997, Corel was looking for an operating system for its new thin-client network computer. QNX and other embedded OSs were considered before one of Cowpland's developers mentioned Linux. He was so impressed with the quality of source code that, in early 1998, he committed to porting his entire line of software to Linux and leaving his hardware plans behind. Rebel.com became the new home of Corel Computer's NetWinder Division. The Ottawa firm already had a reputation for its expertise in the SPARC/UNIX market, so NetWinder running Linux was an easy addition to its product line. NetWinder is, well, tiny! About the size of a book, the under-$1000 unit has a 32-bit StrongARM processor, supports over 150 simultaneous connections, and is ready-to-run out of the box. A menu-driven setup and administration tool enables Web-based administration by any savvy user, and the system supports Windows, Macintosh, and UNIX files. NetWinder.org provides user community news and support.

OEone's Linux-based Web Appliance MMedia will give you full access to the Internet, multimedia content, and on-line applications, plus a Personalized TV.

Drawing on Canvas

Of course, *CorelDRAW* is not the only major PC graphics program to be ported to Linux. Deneba's innovative *Canvas* is bound to encourage graphic artists and designers to try Linux. (You can download the Beta 2 version from the company's Web site at www.deneba.com.) Like *CorelDRAW*, *Canvas* has image-editing and page-layout features. And like Corel's products, it's been ported to Linux by using the Wine library. While Corel's graphics and desktop publishing offerings have achieved wide popularity, it usually requires a special effort to find a high-end printer or service bureau accustomed to handling their output.



Deneba Software has addressed this problem by offering professional pre-press services for *Canvas* files (only). Ship 'em your work, and they'll return the film, matchprints, and even the four-color separations back to you!

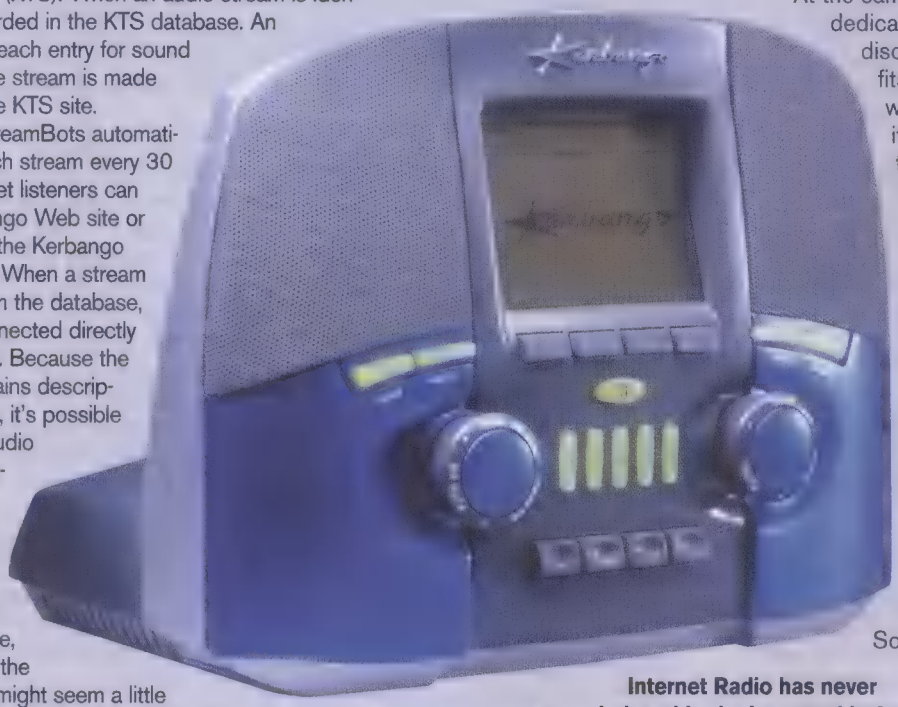
The Internet is my Antenna

The true Golden Age of Radio is about to dawn. Kerbango (www.kerbango.com) will release its first standalone Internet Radio in a few months, and MontaVista's *Hard Hat Linux* (www.mvista.com) will play a key role in the medium's Renaissance. Looking like a funky old kitchen radio, the Kerbango unit is powered by an embedded version of Linux running on a 32-bit Motorola processor. It runs the OS and a special version of *RealPlayer G2* with 8MB of RAM and 8MB of Flash Memory.

Listeners will be able to select from thousands of audio channels, many with CD quality, via Kerbango's audio directory, the Kerbango Tuning Service (KTS). When an audio stream is identified, it is recorded in the KTS database. An editor reviews each entry for sound quality, then the stream is made available via the KTS site. Kerbango's StreamBots automatically check each stream every 30 minutes. Internet listeners can visit the Kerbango Web site or simply turn on the Kerbango Internet Radio. When a stream is selected from the database, the user is connected directly to the host site. Because the database contains descriptive information, it's possible to search for audio streams on keywords such as title, artist, geographical location, and subject matter.

At first glance, the concept of the Internet Radio might seem a little retro. But Kerbango's technology is state of the art. Web sites looking to integrate Kerbango will find its XML interface simplifies the process. The KTS SQL database has a capacity of nearly 25GB and 916 peer hosts, enabling the service to scale to millions of sites and devices. The four-pound radio unit is equipped with a 10/100 Ethernet port, a 56K V90 Modem, Hi-Fi stereo line outputs and headphone outputs, two full-range stereo speakers powered by 2 watts per channel, a clock radio, and alarm. When new audio formats or OS upgrades are released, the unit can be upgraded remotely.

The Kerbango Internet Radio is an early sign of two related revolutions quietly gathering steam. Increasingly, radio and television stations are putting their signals on the Web, where Webcast services are playing a role similar to local Cable TV companies. On one hand, it means that local television and radio broadcasts are becoming available everywhere else on the planet. On the other hand, the same stations are suddenly finding themselves in an unregulated medium with a potential audience of several billion. At some point, the dam will burst, and today's broadcast media will become as relevant as AM radio has become.



Internet Radio has never sounded, and looked so good before.

At the same time, manufacturers of dedicated computer devices are discovering the immense benefits of free, Open Source software. MontaVista introduced its *Hard Hat Linux* distribution last year for the CompactPCI platform, which is widely used in telecommunications and industrial computing. The Kerbango Internet Radio version includes support for the radio's custom hardware and streaming media. The Real Time Operating System (RTOS) field has been littered with dozens of proprietary competitors for decades, making it expensive and difficult to create new devices. But a royalty-free, Open Source OS means that manufacturers can take advantage of Linux expertise, drivers, and development tools. Linux already runs on many of the chips and architectures favored by RTOS designers.

Hard Hat Linux employs a 100% pure Linux kernel, extended with special components for Internet appliances, communications equipment, and mobile computing. Carl Hewitt, a co-founder of Kerbango, said "Customers will expect Internet appliances to work like their telephones and TV sets. No crashes, error messages or reboots."

Imagine that.

duOS Workstation runs Windux

EBIZ Enterprises has debuted its new line of dual-boot workstations, starting at only $799. Both *Corel LINUX OS* and Microsoft Windows 98 are pre-installed, saving time and the aspirin budget. More importantly, both the Linux and Windows versions of *WordPerfect Office 2000 Suite* are loaded as well. Because Corel has engineered compatibility with *Microsoft Office* and *Lotus* file formats, duOS users can work with the same files under either operating system and with any major office suite, making a smooth transition to Linux feasible for the average office worker or home user. Available through its TheLinuxStore.com site, EBIZ also provides technical support through TheLinuxLab.com. We'll review one soon.

duOS PCs run Linux and that *other* OS too.

Microsoft Goes On The Defensive

Government calls for a breakup

"Depend upon it sir, when a man knows he is to be hanged in a fortnight, it concentrates his mind wonderfully." –Samuel Johnson

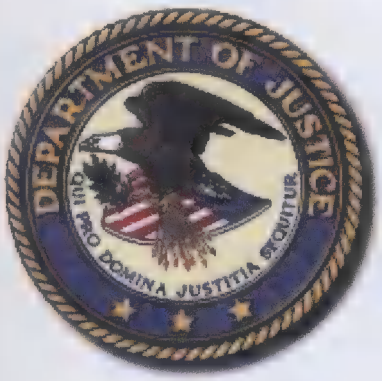
You can depend upon it, minds are being concentrated across the computer industry. The titanic struggle for desktop dominance is no longer a polite matter of price, performance, and compatibility. Legions of lawyers have joined the fray, eager to shape the future which, one way or another, will stare you, gentle reader, in the face.

On one side, a disciplined marketing giant is putting a calm exterior on a rising sense of panic. On the other side, the ragtag band known as "the Linux community" is trying to assemble the clans and form the alliances necessary to take the field. As with any war, it is a question of which world-view will survive: a world-view that has reached its maturity, or one that is struggling to come of age.

With strong unanimity, lawyers from the U.S. Dept. of Justice and the Attorneys-General of 19 states released on April 28th a 17-page document calling for Microsoft to be split into two companies. One firm would hold the operating systems (Windows 98, Windows 2000, Windows CE), while the other would inherit all applications and hardware products. Both companies would be forbidden to collude, and would compete against each other in the future. Microsoft is meanwhile prohibited from retaliating against witnesses in the trial and must hire a Chief Compliance Officer to oversee its behavior until the split occurs.

"It won't remedy anything," said Microsoft legal advisor Rick Rule. "It shows how desperate this case is." Indeed, even those in favor of action against Microsoft were not unanimous. Ribert Litan of the Brookings Institution has filed a friend of the court brief calling for Microsoft to be broken into no less than four companies. "The proposed remedy produces two new monopolies, instead of one," he said.

"Windows could not have been developed under these rules," said Microsoft Chairman Bill Gates, in a taped response shortly after the announcement. What the court sees as a monopolistic practice, the tying together of Windows and Microsoft applications through a closed API, Gates calls "synergy." CEO Steve Ballmer repeated their position that "Microsoft is very clear that it has done absolutely nothing wrong." Both founders have frequently claimed that tearing Microsoft apart would be somehow damaging to the American economy and to consumers.



Microsoft's world-view, distilled in television fireside chats from Bill Gates and Steve Ballmer, assures us that the benefits of the microcomputer revolution have not only been delivered largely by Microsoft, but "the best is yet to come." Gates paints a picture of a tiny band of friends, presumably dressed in green tights, struggling to bring these benefits to the world against all odds, achieving world dominance through knightly acts of pure intention. Somehow, the grizzly details of the Crusade are wiped from the memory.

Gates' and Ballmer's message, repeated in messages to the Redmond rank and file, industry events, and meetings with the press, admits to no wrong-doing and asserts that the breakup of Microsoft would somehow be a disservice to the consumer.

"And the worst nightmare occurs: the masses have a vision of free software, open source code, and voluntary collaboration!"

In their view, Microsoft has achieved a stranglehold on the desktop not through brilliant marketing and assimilation, but through "innovation," innovation which has almost never come from within Microsoft itself.

Software empires may be in the business of inventing the future, but they are not exempt from the laws of economics and history. Microsoft's Borg-like strategy of embracing, extending, then assimilating standards and competitors could only continue as long as there were new regions to conquer. A goldfish grows as big as the pond in which it lives. But once it reaches a certain size, there is a shortage of food and oxygen. Now the biggest fish in the pond, Microsoft will find it difficult to generate increasing profits from its established product line. Windows 2000, after all, was a billion dollar project. Given the speed and comparatively tiny costs with which competing environments such as Linux (and altogether unenvisioned developments which might break through at any moment) evolve, how many times can Microsoft respond with products of a similar scale? Sooner or later, the game is up.

Although the business press eagerly pronounces Microsoft as phenomenally profitable, doubt has been raised. Investment analyst Bill Parish believes they have been "blinded by the stock price and unable to see that Microsoft is also the key architect of the greatest financial pyramid scheme this century." Parish's Web site (www.billparish.com/msftfraudfacts.html) includes an analysis of Microsoft's financials which he says has upset a few friends working there. Parish believes "it is possible that even Bill Gates and Steve Ballmer do not realize the implications of their financial practices. The fundamental problem is that Microsoft is incurring massive losses, and only by accounting illusions are they able to show a profit."

Parish believes Microsoft is granting excessive amounts of stock options that are allowing the company to understate its costs. Indeed, one reason why insider leaks are so rare in Redmond is the generous stock options which have doubled about every 15 months in the past decade. What would happen to Microsoft's stock price, Parish asks, if the public suddenly realized that the company lost $10 billion in 1999

rather than earning the reported $7.8 billion? If 80 percent of its stock value, or roughly $400 billion, is the result of a pyramid scheme, what kind of effect could this have on the retirement system?

Denying that they were anticipating the current situation, Gates appointed Ballmer CEO in January, stating that he would be more closely involved in future platforms. It's clear that if the Court ruling is enacted, Ballmer would be in charge of the new operating system company, and Gates would lead the applications company. Though the Court would ban "collusion" between the entities, it would be difficult to end over 20 years of intimate daily collaboration.

Recent announcements by Microsoft either reveal the brilliant innovation Gates mentions frequently, or show a giant in a struggle to find a new identity and new markets. Aware of the inherent superiority of UNIX/Linux's modular design, the next upgrade to Windows 2000, named Whistler, will permit developers to remove components and run subsets of the OS on even handheld devices. Where Gates' vision once was to have a PC on every desk and in every home, it is now to have some portion of Whistler running in even your refrigerator and television.

Meanwhile, Microsoft launched its third version of Windows CE, now named Pocket PC, accompanied by announcements of devices from Compaq, HP, Casio, and Symbol. Ever since Windows 3.1 and Word 3.1, Microsoft has earned a reputation for dragging users through at least two lame versions of a product before releasing something usable. The coincidence was not lost on observers. "If you're catching a whiff of desperation in the air, it just may be blowing over from Redmond," said Dan Briody, an editor-at-large for InfoWorld. PCWeek columnist John Dodge complained that the computer journalists who covered the launch have memories as short-lived as fruit flies. "How can they acclaim an untested product," he writes, "when Microsoft's repeated stumbles have given Palm an estimated 65-80% of the PDA market?"

Court documents show how much this concerns Microsoft. A censored version of a supporting document notes that in July, 1999, less than 30 days after the conclusion of the trial, "Bill Gates ordered his staff to redesign its software in order to harm competitors." The Gates e-mail specifically discussed the Palm computing platform, but his conclusions were not revealed.

Games running on X-Box may look like this.

Having surveyed the neighboring land of Gamia, Gates has rallied considerable troops to assimilate the territory. In March he revealed the secret X-Box game console, together with announcements from a group of game developers including Electronic Arts, Universal, Hasbro, and Titus—nearly all of whom have found reason to commit significant resources to a platform which is at least a year distant, yet ignore millions of existing Linux users. It was later revealed that the demo employed existing PC hardware, and the official X-Box site (www.xbox.com) displays sample graphics that look about as good as any other animation these days. Despite talk of an AMD chip, the specs now call for a 600 MHz Intel processor with a custom 3D NVIDIA graphics processor, 64MB of RAM, 8GB hard drive, a DVD drive (the X-Box OS will be included on each game disc), 100 MBps Ethernet, and a Broadband Internet connector.

Dominant player Sony, of course, will retaliate by adding a modem and hard drive to the U.S. version of Playstation 2. New game units will be marketed as Internet gateways, not just numbingly violent distraction machines. And they are likely to arrive a year ahead of X-Box.

Popular columnist Robert X. Cringely believes there is a real chance the X-Box will never arrive. He believes the true purpose of the announcement is to keep game devices from encroaching on Microsoft's PC monopoly. "X-Box succeeds if all it does is slow down development of competitive products," he says. He notes that Sony is putting $100 million into non-game applications for the Playstation 2—non-Windows— applications. Remember, TiVo runs Linux, not Windows, a fact that must irk Redmond enormously.

It's Basic, my Dear Watson

Do you think the court documents contain strong language? How far could Microsoft have gone? For another view, see www.stokely.com/~glenn/ms/english.html

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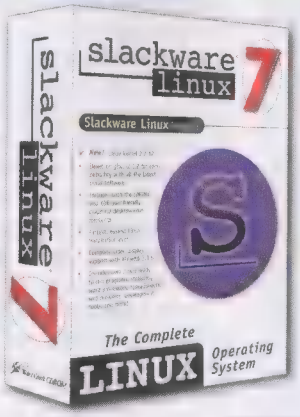

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Storm Linux 2000

A RECIPE FOR SUCCESS

If you're itching to brew up something special in your Linux box, try this on for size. Start with one PC. Add *Debian GNU/Linux 2.1* and heat until melted. Pour in XFree 3.3.5, October Gnome, KDE 1.1.2, and mix thoroughly. Blend in a slick graphical installer and add a dash of a graphical boot loader. Bring to a bubble. Let stand until cool, and you're ready for a taste of *Storm Linux 2000*.

If you think this recipe seems like a mishmash of Linux applications "hacked" together to form a "new" distribution, you'd be completely mistaken. *Storm Linux 2000* is both new and solid, but its *Debian* core–renowned for its stability, rigid Q&A cycle, and strict adherence to the GNU Public License (GPL)–is what makes *Storm Linux 2000* extremely compelling to many Linux users.

For starters, *Storm Linux 2000* focuses on choice. In addition to offering both KDE and GNOME window managers, you also get to choose between a very slick GUI installer, or a text-based one–which can come in handy if there are problems with your video card. You can also choose whether to boot into X automatically or perform the task manually upon booting. In fact, the installer provides full control over virtually every aspect of the install process. Don't be alarmed by the attention to detail it provides–installing *Storm Linux 2000* is both easy and fast. If partitioning your hard drive makes you cower in fear, relax. The Standard edition of *Storm Linux 2000* ships with *Partition Magic 5 Special Edition*, so you can repartition and move partitions within Windows.

The Storm installer offers a small variety of optional packages, for both the console and graphic environments, including games, development, networking, and utilities. However, some categories have very few options. For example, the Net category offers only *X-Chat* (a GTK IRC client) and *Netscape 4.6*. (Note: *Netscape 4.6* is only included with the Standard Edition, not the downloaded version.) Despite this, *Netscape* is available on Stormix's FTP site, and users can use the Storm Package Manager (see sidebar) to install *Netscape* at a later date.

One of the best features of the Storm installer becomes apparent when it comes time to configure the X server. Using a beautiful graphic image as a test, *Storm Linux 2000* allows you to see some X server settings,

***Storm's* installer is one of the best we've seen. Period. Try it out. We're guessing that you'll like it!**

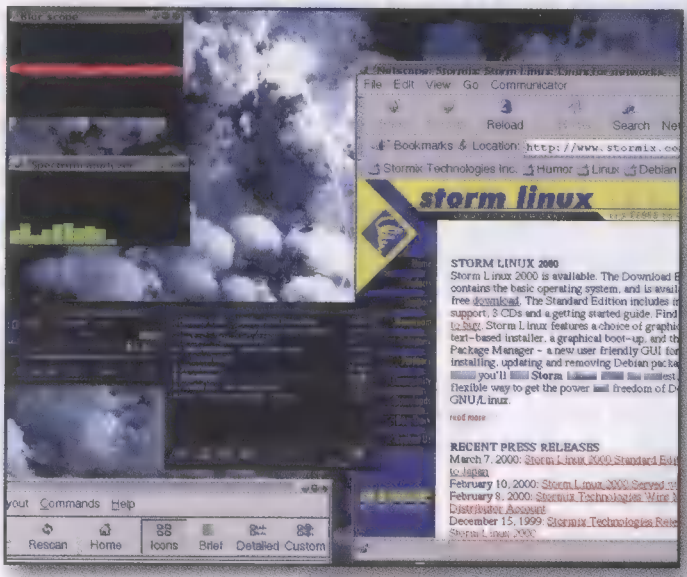
including your screen alignment and color depth, before you commit to using them. It's a great feature–especially if something goes awry in your choice of configuration–and something that all Linux distributions should include.

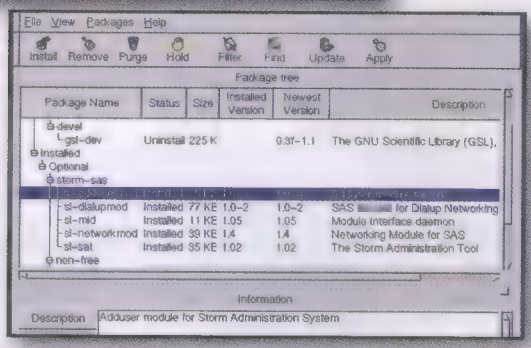
Not satisfied with just a custom repackage of Debian, *Storm Linux 2000* also adds some custom new utilities to make administration of your Linux system much easier. The two main utilities are the Storm Administration System (SAS), which allows you to connect to other Storm Linux systems on your network and administer them remotely from a single machine; and the Storm Package Manager, a slick graphical front-end to Debian's deselect and apt-get utilities. SAS currently provides only three main modules: User Account Management, Network Module, and Dialup Networking Module. More modules are in active development for sound configuration, X configuration, and other areas, and should accompany the next version due out this summer. *Storm*

For definitions of Terminator words, hyperlink to the back of Maximum Linux, or check out the Terminator online at www.maximumlinux.com

Linux 2000 also incorporates the Storm Administration Tool (SAT), allowing you to create new users and groups, configure your DNS, and set up your Ethernet card or modem with ease. But, although we liked the functionality of SAT, we didn't care for the design of its user interface. While relatively easy to understand, it's cumbersome, requiring too many clicks of the mouse to execute a simple command. Compared to such tools as *LinuxConf*, the SAT interface needs a lot more work.

Storm Linux 2000 ups the ante on another GUI front: LILO. This new graphical front end makes it very easy to see what operating systems you've set up in LILO and move among the choices. Nice.





The Storm Package Manager is a tasty treat, as is the Storm Administration System, which lets you connect to other Storm Linux-equipped systems on your network and administer them remotely.

Still, as good as all this may sound, *Storm Linux 2000* is not without its faults. One update sadly missing from this release is the newer glibc 2.1. Instead, Storm relies on glibc 2.0. This is disappointing, since many new packages come pre-compiled for glibc 2.1. The official company line is that the next release of Debian (dubbed "potato") which uses the newer glibc had not moved to "frozen" status. This doesn't prevent you from updating it yourself. It is, in fact, very easy to update to the latest Debian base using apt-get.

We also ran into some problems with the Installer not recognizing newer hardware. For example, our machine had a Voodoo3 3000 AGP graphics card and a SoundBlaster Live! MP3+ sound card installed. The Installer knew they were there–but didn't include any driver support for either of these devices. (The Voodoo3 card was easily set up with the included version of *XFree86* however, the drivers for the SoundBlaster Live! card had to be downloaded from http://opensource.creative.com) The folks at Stormix tell us that such hardware issues will be addressed in the next version of *Storm Linux*–which should be beta testing by the time you read this–but until that happens, color us unimpressed.

Another oddity: You can only install *Storm Linux 2000* from the CD, not over NFS, FTP, or mounted ISO image. Again, we've been informed that these issues will be addressed in the next release, but it's still an oversight.

On the positive side, Stormix's technical support is excellent. The company's Web page includes a bug-tracking system for users to report bugs, suggest features, and see progress on existing bugs. All bugs we reported have already been addressed in minor updates to utilities (such as the DHCP interface in the Network Module for SAT) or earmarked for the next version. Overall, we found the support staff to be competent, informative, and helpful.

Storm Linux 2000 comes in two flavors: a bare-bones downloadable ISO image and a Standard Edition, which also comes with PowerQuest's *Partition Magic 5.0 SE*, *StarOffice 5.1.a*, *Netscape Communicator 4.6*, and demos of *Applixware Office 4.4.2*, *VMWare 1.1*, *BRU Backup*, and BlackHoleSun Software's nifty (and very addicting) game *Krilo*. The Standard Edition also includes 30 days of toll-free phone support, 120 days of free e-mail support, and a pretty robust manual containing installation and configuration tips.

Overall, *Storm Linux 2000* tastes pretty good. With a bit more seasoning, however, it would taste even better. –Carl B. Constantine

MAXIMUM LINUX VERDICT

Price Free download, Standard $50
Company Stormix Technologies
Phone 877.786.7649
URL www.stormlinux.com

CHECK THIS OUT!

We were impressed with the Storm Package Manager, a utility that provides full control of packages already installed on your system and ones available from the Storm or Debian FTP sites. You can install, remove, and purge packages, as well as view the status of any given package–either uninstalled, installed, upgraded, or older–all from a simple interface. In essence, the toolbar provides one-step everything you'll ever need. (Well, almost everything!)

This wonderful utility provides an extremely easy-to-use interface to the Debian dselect apt-get tools. The toolbar includes buttons for the most common actions performed in dselect. If you install a package that requires dependencies, a new window opens showing which packages are required and whether or not you have already marked them for installing. Storm's creative use of color in the dependency window allows you to quickly determine which packages required, optional, or will be removed as a result of installing the new package.

Another nice feature is the filter function. Instead of searching for each occurrence of "storm" using the find function, the filter function allows you display all occurrences one time regardless of whether the search string appears in the package name or in the package description. The filtered display gives you quick glance access to the requested packages and their status.

All in all, very cool.

REQUIRED

x86 Processor; 32MB RAM (64MB RAM recommended); 300MB minimum hard drive space (1GB or higher recommended); CD-ROM drive; VGA video card; mouse.

HIGHS

- Excellent graphical install
- Storm Package Manager
- Excellent technical support

LOWS

- Older glibc
- CD-only install
- Netscape only included in Standard Edition

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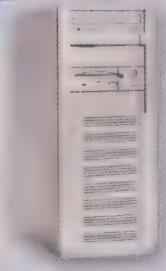

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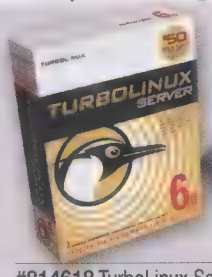

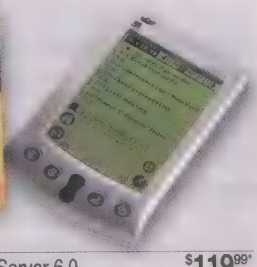

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Cobalt RaQ 3i

RACK THAT WEB SERVER

STILL NOT CONVINCED?

"Linux" and "simple" are two words that are very rarely seen together in the same sentence. If you work for a company who needs serious Web performance and the reliability of Linux, but you don't feel like hiring a UNIX geek to run the whole show, look no further than Cobalt's RaQ 3i server. It's fast, powerful, easy to use, and if you already have a substantial IT infrastructure, it takes up virtually zero real estate in your already packed server room. Capable of handling up to 35 million hits per day, the RaQ 3i is a thin Web server appliance that holds its ground with PC servers that take up 10 times the amount of space and cost a whole lot more, too.

THE SPECS

Intel-compatible processor running at 500MHz, dual 10/100 Base-T auto-sensing Ethernet ports, embedded Ultra-Wide SCSI controller for external storage

HIGHS

- Serious Internet server performance in a very small package
- Web administrative interface makes running dozens of virtual sites and Internet domains a breeze
- Software installation and updates are easy

LOWS

- Hefty price tag
- Tight integration with Web-management interface and pre-configured server s/w prohibits serious tweaking
- With the exception of external disk, the hardware isn't upgradeable

Maybe you're an aspiring DotCom Internet e-business, an ISP, or a corporate IT department strongly interested in Linux and Apache as a fast and reliable alternative to Windows NT for Web and domain hosting, but you don't have the Linux experience in-house to set it up properly. Conversely, you might have a lot of Linux experience, but you'd like to offload some of the nasty administrative overhead to your customers, who'd like tighter control of their Web sites but want a simple interface to enable them to do it themselves. If these scenarios sound eerily familiar to you, then look no further than Cobalt's RaQ 3i.

Cobalt's RaQ 3i is all that you and your enterprise need to get Apache and virtual domain hosting running in a jiffy under Linux.

The RaQ 3i is a Web-manageable Linux Web server and complete domain- hosting computer, all engineered to fit in a 1U-sized rack-mountable enclosure. In non-geek-speak, this baby is the size of a large pizza box. Once installed in a standard server rack, you simply plug in the power, connect it to your Ethernet switch or backbone, and set the unit's internal IP address in the RaQ 3i's front panel–then the fun begins.

To begin hosting Web sites on the RaQ 3i, you simply connect to it over a Web browser using the following URL: http://insertyouripaddresshere/admin. With a few simple clicks of the mouse, and by following Web-based wizards, you can quickly create new virtual Web sites and user accounts, turn on e-mail services and FTP, configure DNS services, and view activity reports. The administrative mode can also be used to turn on the RaQ 3i's built-in FrontPage extensions, which enable users to easily administer their own Web sites using the *FrontPage 2000* GUI HTML authoring and site management tool. (Maybe it is a Windows world…)

Alternatively, users can interact with the RaQ 3i via Telnet shell accounts, where the standard Linux CLI rules apply. You can install and run any Linux X86 software on RaQ 3i, and run standard CGI programs and Perl scripts. However, if you want to go so far as to recompile the Linux kernel or Apache to suit your specific needs (for example, if you'd like to install PHP3 or MySQL from the source code), you're on your own. Although Cobalt doesn't provide direct technical support in such cases, the company's Web site does have a lot of information that experienced Linux admins will find helpful for tweaking the RaQ 3i to their hearts' content.

Not only is site and user administration a breeze on the RaQ 3i, but maintenance and software installation is so easy that even pointy-heads can do it. When Cobalt comes out with RaQ 3i bug fixes and enhancements, or if you want to add third-party program applications to it (such as ChiliSoft's whup-ass ASP server for Linux), you just simply have to visit the RaQ 3i maintenance Web page and enter a related URL to get the fix. We were able to upgrade to a new version of 128-bit SSL simply by pasting in a URL from Cobalt's support page and clicking on a button. Backups or restoring the system's configuration are also as easy as clicking a mouse. Should you–or one of your users–accidentally blow the RaQ 3i's original settings, you can restore the entire system to its default configuration using the optional $99 OS Restore CD.

Cobalt recently announced a special e-business version of the RaQ 3i, dubbed the Intershop RaQ, which includes Intershop's e-business *Merchant* software and Signio's and Cybersource's credit card payment systems pre-installed. Given the RaQ 3i's stellar performance and ease of use/setup, this should prove to be a great solution for companies looking for a quick e-commerce fix.

The RaQ 3i doesn't fit everyone's bill, but it comes pretty darn close to being the ideal solution for those looking for a turn-key, easy-to-administer, ISP-worthy Linux server platform.

–Jason Perlow

MAXIMUM LINUX VERDICT

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OTHER CHOICES

If you didn't go with a GigaDrive, what are your alternatives? Chances are, you'd go out and buy a new hard drive, a bunch of NIC cards, some Cat 5 cables, a hub, and then jury-rig something using Windows for Workgroups peer-to-peer networking, where one PC acts as a non-dedicated server for disk storage and is connected to a shared printer. And, if you're running that server on Windows 98, you can forget about sharing files with any Macs. For that, you need Windows 2000 Server, which will set you back about 800 buckaroos for a copy with 5 client licenses, not to mention the extra cost for more CPU horsepower and the RAM needed to run it properly. And unless you're a networking guru, you'll probably need to hire a professional systems integrator (who charges by the hour) to hook it up. Can you say ka-ching?

THE SPECS

20GB hard drive; Pentium-grade CPU; one auto-sensing dual-speed RJ-45 port, one parallel port

HIGHS

- A low-cost, serious SOHO server
- Platform-independent browser administration
- Mac compatibility

LOWS

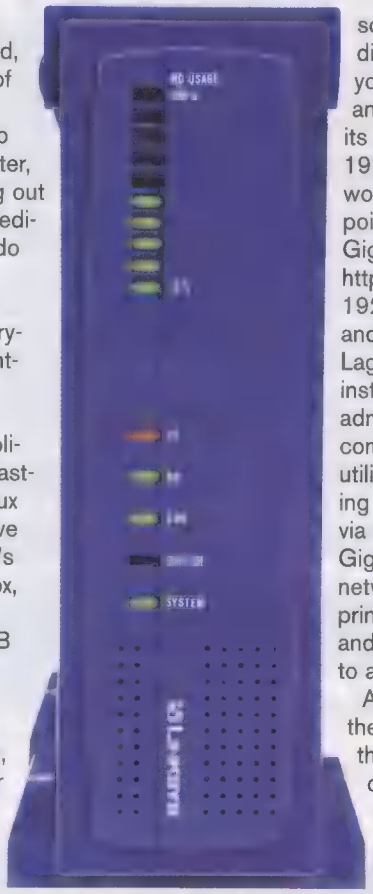
- Initial setup requires doing an IP address swap
- No native Linux LPD or NFS support
- Storage can't be expanded

Linksys Instant GigaDrive

SETTING UP A SERVER WITH EASE

Let's say you've got a small office or a multi-PC household, and maybe you've got a mix of Windows machines, Linux boxes, and Macs. You need to share disk storage and a printer, but you don't feel like shelling out a fan of Franklins to build a dedicated server machine. What do you do?

Enter Linksys's Instant GigaDrive, the answer to everyone's SOHO networking nightmares. The GigaDrive is a Network Attached Storage (NAS) device, or a server appliance (yes, appliance, as in toaster) running on embedded Linux whose sole purpose is to serve up files and share a printer. It's slightly bigger than a cigar box, but this little guy packs a big punch! It's got a built-in 20GB hard drive, a 10/100baseT Ethernet port, and a parallel printer port. To top it all off, you can administrate this little, blue cutie remotely using your Web browser—no extra monitor, keyboard, mouse, or awkward KVM switches needed. Folks, servers don't get any easier than this.



The GigaDrive makes setting up your home or office server a real breeze.

Here's how easy it was to set up. After removing the GigaDrive from its packaging, we plugged in the power supply, connected a twisted-pair cable to our fast Ethernet switch, and hooked up our aging HP LaserJet 5P via a parallel cable to the unit's printer port. Oh yea, we had to switch the GigaDrive on too. Hard work, eh?

Of course, you'll want to make sure that your workstations have the TCP/IP protocol set up, and, if they are Windows machines [*ed note: they'd better not be!*], that the Microsoft Networking client is installed. If you're accessing the GigaDrive from a Linux machine, you'll want to have the Samba client running and your print queue set up to redirect your print jobs to a Windows printer. If it's a Macintosh, you'll also want to use the AppleShare protocol, which most iMacs have enabled out of the box.

By default, the GigaDrive has a default TCP/IP address of 192.168.0.2, so if your LAN has a different subnet address like ours (which uses a 10.x.x.x internal class B addressing scheme), you'll want to temporarily disconnect all your devices from your hub except for one workstation and change both its IP address and its default gateway address to 192.168.0.1. After rebooting the workstation, all you have to do is point your Web browser to the GigaDrive by entering a special URL: http://192.168.0.2/CGI_main/index.htm, and (with apologies to Emeril Lagasse)—BAM! You'll have an instant server with which you can administrate from any networked computer—without using any clunky utilities or overpriced network operating systems. Once you're connected via browser, you can change the GigaDrive's IP address to match your network's settings, enable the built-in printer port, create shares, add users, and set up the built-in DHCP server to auto-configure your workstations.

Although the GigaDrive was one of the easiest servers we've ever had the pleasure of setting up—and one of the fastest we've seen for the money—it would've been nice to have a direct way of configuring the IP address, perhaps by using an LCD panel and a few buttons. Having to disconnect your LAN or connect a temporary hub for configuration purposes can be a real hassle, especially if you're networking the GigaDrive in a corporate environment. We'd also appreciate more Linux-friendly features, including support for printing through a native LPD printer queue and UNIX-style networking via NFS.

Despite these minor grievances, the GigaDrive is a gem of a server appliance to administrate and use, and, at a street price of under $700, you won't go broke or crazy trying to roll your own reliable file and print sharing solution using Windows NT or Samba.

—Jason Perlow

MAXIMUM LINUX VERDICT

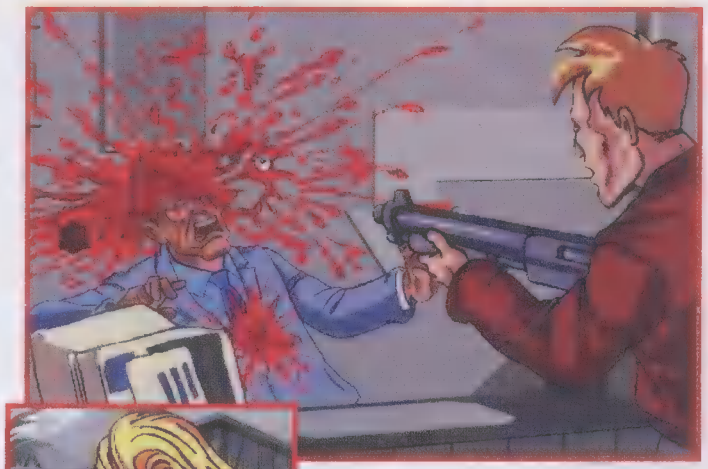
Price $660
Company Linksys
Phone 949.261.1288
URL www.linksys.com

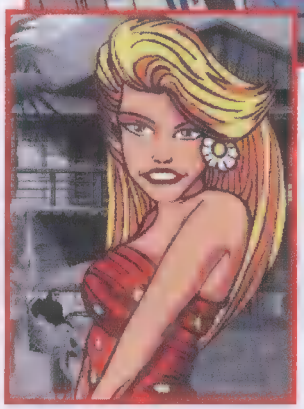
8

Hopkins FBI

IT'S VIOLENT AND FUN

Hopkins FBI is a standard point-and-click adventure game, but it's so gory, bloody, and violent, we're not surprised that you can't find it for sale at your local Wal-Mart store. However, if you're not easily disturbed by the images of flying bullets and severed limbs, we bet you'll enjoying playing *Hopkins FBI* as much as we did.





Hello sweet thing! Can I give you a call sometime?

I spy, with my little eye, an eyeball in mid-air. Eewww...

The story line is fairly simple. A terrorist named Bernie Berckson gets his hands on two nuclear warheads and tells the U.S. Government he'll explode them if his demands aren't met. The government refuses to negotiate, both warheads are exploded over California, and 50,000 people die (they must've been small bombs!). The FBI finds Bernie, thanks to the efforts of Agent Hopkins. You see Bernie getting the chair in a cool animated–and very bloody–sequence, but then the lights go out, and Bernie mysteriously disappears. You play the role of Special Agent John Hopkins, and although the documentation doesn't actually specify this, it's your job to track him down again.

As expected, you can interact with your environment, using a combination of mouse clicks and menus. Despite a few quirks–which are explained by the documentation–the interface is fairly intuitive. In fact, the entire game is like watching a live-action comic book. The animation is superbly done, and it's obvious that a tremendous amount of care went into the sound, music, production, and visuals. The hand-drawn, cartoonish animations are some of the coolest we've ever seen on Linux.

Hopkins FBI uses Sam Lantiga's Simple Direct-Media Layer (SDL) library, with beautiful results. The wonderful color, great music, and full-screen mode enhance the comic-book quality of this game. But, the mood of this game is dark, dark, dark, and there's more than enough gratuitous blood and violence to make a movie such as *Scream 3* look like a Disney flick. Since males are the intended target audience, *Hopkins FBI* is also filled with buxom women and lots of gratuitous nudity.

A common problem with adventure games is that the puzzles can often be unreasonably difficult, making a trip to a cheat site almost unavoidable. Not so with this one. Although the puzzles in *Hopkins FBI* did require a lot of thought, the solutions made sense. In fact, we suspect veteran adventurers might find this game too easy. Nevertheless, the visuals and music alone are enough to keep everyone interested.

Installation of the program proceeds flawlessly, as long as you remember to either remove the user option or add the exec option in your CD ROM's entry in /etc/fstab. A full install comes to a whopping 411MB, but you can cut this down to 18MB if you want to run animation off the CD. One warning: The manual that ships with the installation CD was obviously written without a spell checker. In fact, the game is unbelievably replete with typos, spelling mistakes, and god-awful grammar. Also, if you do run into some technical problems, don't expect to receive any help. Our original e-mail to MP Entertainment went unanswered, and only after sending a second request did we receive a vaguely helpful, terse reply. Also ignored were our requests for information about the pending release of *Hopkins II*.

If *Hopkins FBI* sounds appealing, and you don't mind awful customer support, we guarantee a good time. But, if you think there's already too much violence and nudity on TV, and have delicate sensibilities, you should probably stay away.

–Peter J. Salzman

MAXIMUM LINUX VERDICT

Price $40
Company MP Entertainment
Phone 877.734.7638
URL www.hopkinsfbi.com

GETTING TO KNOW SDL

The native language for programming X applications is a C library named Xlib. Unfortunately, programming in Xlib is a horrible mess. As a result, there are C libraries that are designed to simplify programming X, such as Sam Lantiga's phenomenal Simple Direct-Media Layer (SDL).

SDL is much more than a simple graphics library. It also provides an easy interface for sound and music. The most striking thing about SDL is that it's platform independent. Any program you write with SDL on Linux will compile on Windows, MacOS, and BeOS. The developer's version (1.1) even includes joystick and OpenGL support.

The fast-growing list of games being written using SDL is impressive: *Circus-Linux*, *Defendguin*, *Heretic II*, *Hexen*, *Scavenger*, *SDLDoom*, and *SDLQuake* are just a few.

Check out SDL at: www.devolution.com/~slouken/projects/SDL/index.html.

REQUIRED

Pentium 166MHz; 16MB RAM; X window; Glibc 2.x

HIGHS

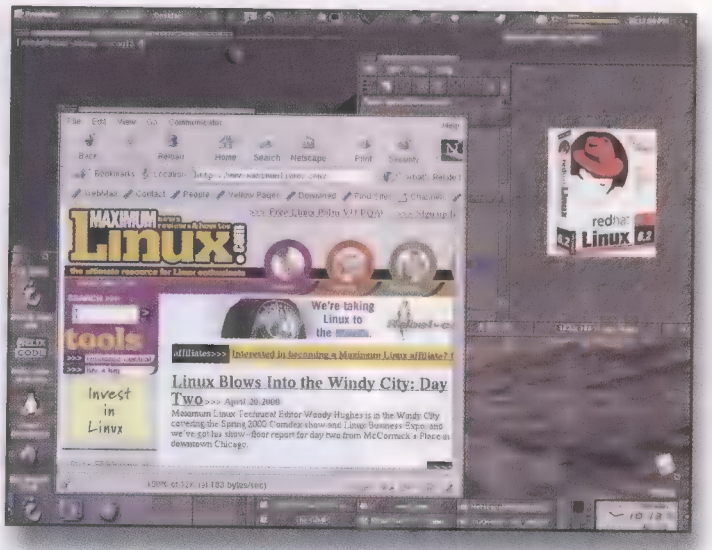
- Beautiful animation, spectacular soundtrack
- Professionally produced
- Realistically solvable puzzles

LOWS

- Content is definitely not for everyone
- Adventuring veterans might find this game easy
- MP Entertainment provides poor support

RedHat Linux 6.2

ONE STEP FORWARD, ONE STEP BACK



Red Hat Linux 6.2 is a good distribution, but it's bogged down by a weird installation routine. Unless you're a die-hard Red Hat fan, we recommend waiting for version 7.0.

In the world of Linux distributions, there are always a plethora of flavors ready and waiting, hungry to hit the market. When Red Hat released its latest offering, *Red Hat Linux 6.2* recently, we couldn't wait to tear off the shrink-wrap with our teeth and dive right in. But once we did, we soon realized that, although *Red Hat Linux 6.2* is good, it should've been great.

The first thing you'll notice with any distribution is the installer. *Red Hat Linux 6.2* comes in two flavors. One is text-based for the real man (or woman) in you, and the other is a clean and professional-looking X-windows-based program called *Anaconda*, where–believe it or not–you can actually use your mouse to configure your system.

You would expect the installation process to be easy, considering that Red Hat lets you put the whole distribution on a big, fat Windows partition, with no need to re-partition anything. Unfortunately, the technical folks in North Carolina have decided that you still need to actually do something tricky, like mounting the root (/) partition on an existing Windows file system.

The madness doesn't end there. There's no way to exit the installation. That's right–there's no EXIT button! Sure, you can still press CTRL+ALT+BACKSPACE to get out of just about any running X-Windows Server, but this sure as hell isn't something obvious for the average Joe Windows user, or even Bubba Solaris.

Now upgrading Linux, no matter what flavor you choose, is something that's relatively easy to deal with. Thankfully, we didn't have too many other problems, except for a nasty little episode getting a simple SoundBlaster 16 to work.

All is not lost, however. *Red Hat Linux 6.2* does have a few new features. At a core level, improvements have been made to centralize kernel tuning parameters, using a program called sysctl. Other improvements include the inclusion of *Mesa*, a free OpenGL implementation that works on the Linux OS, and better Workstation installation routines that won't fill your machine with unwanted services.

In the new package department, *Red Hat Linux 6.2* ships with the latest 2.2.14 kernel, but no *XFree86* version 4, which apparently was released when *6.2* was in late beta. There's also a cool install of a privacy program called *GNU Privacy Guard*, as well as a few different encryption-ready e-mail programs. Of course, you'll also find KDE and GNOME in the distribution. We like KDE, so that's a plus.

Red Hat has included the Beowulf "do-it-yourself supercomputer" technology, so you can build that machine that Grandpa always used to talk about. That's right, fellow Linux users, *Red Hat Linux 6.2* ships with the necessary tools to configure that Beowulf to suit your processing fancy!

All in all, *Red Hat Linux 6.2* is still one of the strongest distributions out there, but when you get down to the nitty gritty, there really isn't much of a difference between version *6.1* and version *6.2*. Although *Red Hat Linux 6.2* should make even the average user a happy little Penguin, we say wait until version *7.0* is released before you spend any of your hard-earned money.

–Hassan Aurag

WHICH ONE SHOULD YOU CHOOSE?

Red Hat offers many different versions of its OS, including the usual free download, which we reviewed here. There are three basic choices from which to choose. The $30 Standard, $80 Deluxe, and $180 Professional versions include 30, 90, and 180 days of support, respectively, and all ship with some really kick-ass programs along with CCVS, Red Hat's new credit card verification system.

REQUIRED

x86 processor with recommended mimimum of 16MB RAM and 500MB hard disk space; bootable CD-ROM drive or 3-1/2" floppy drive.

Red Hat supports most pieces of modern Intel-compatible PC hardware including Pentium II and Pentium III processors. If you have questions about hardware compatibility, check out Red Hat's compatibility list at: www.redhat.com/support.

HIGHS

- High quality and stability
- Security enhancements
- Clustering and supercomputing technology

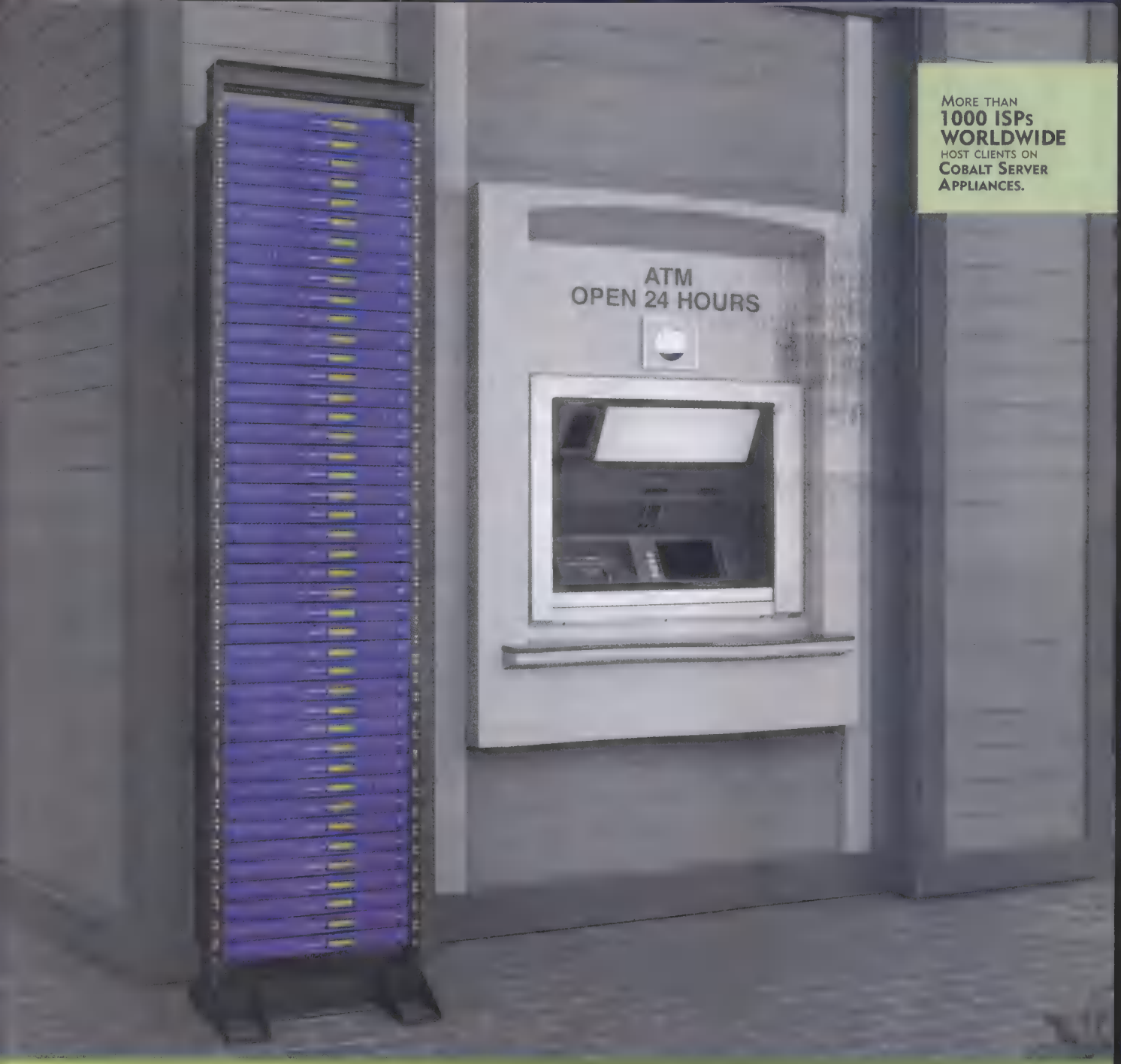
LOWS

- Installation/upgrading annoyances
- No *StarOffice*
- Needs better re-partitioning tools

MAXIMUM LINUX VERDICT

Price Free download; $30 Standard version; $80 Deluxe; $180 Professional
Company Red Hat
Phone 888.733.4281
URL www.redhat.com

8



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BOOTING WITHOUT MAC OS

yaBoot–a spiffy new boot utility–lets you boot directly into Linux on certain Power Macintoshes without first booting into Mac OS. *yaBoot* is an Open Firmware-based boot loader that works with New World-based Macintoshes–the iMac, iBook, blue-and-white G3s, and all G4s. This widget needs a 32MB Mac OS disk partition on which it and its configuration files live–it acts as a sort of meta boot block. Although it is constantly in development, *yaBoot* still has some limitations. If you have more than one IDE drive, you'll need to put *yaBoot* on any partition on the first IDE drive. Also, it won't work with SCSI drives, so, if all you have is an SCSI drive (or you're not willing to build a partition for it on the first IDE drive), you'll have to use the more traditional *BootX* method. Find out more about *yaBoot* at Ben's Linux/PPC page at: http://ppclinux.apple.com/~benh/.

REQUIRED

PCI-based Power Macintosh or IBM RS6000, 32MB RAM (more is better), 2 GB hard drive recommended.

HIGHS

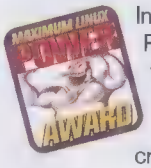
- Stable
- Solid server apps
- Best app selection of any Mac distro.

LOWS

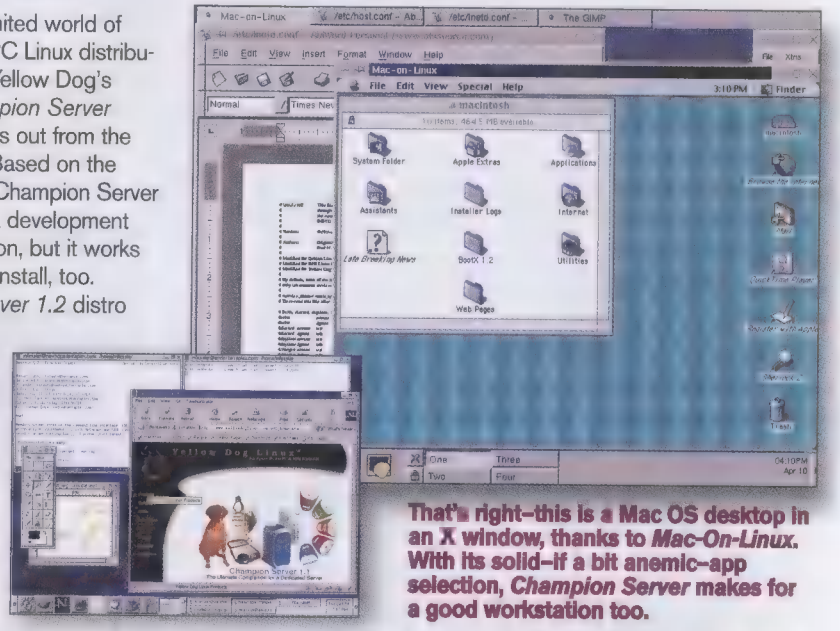
- CD only bootable on newer Macs
- Uses Red Hat installer
- Difficulty with X setup

Champion Server 1.2

A POWER MAC'S BEST FRIEND



In the limited world of PowerPC Linux distributions, Yellow Dog's *Champion Server* stands out from the crowd. Based on the 2.2.15pre7 kernel, Champion Server is meant primarily as a development and server configuration, but it works well as a workstation install, too.



That's right–this is a Mac OS desktop in an X window, thanks to *Mac-On-Linux*. With its solid–if a bit anemic–app selection, *Champion Server* makes for a good workstation too.

The *Champion Server 1.2* distro comes on three CDs–a bootable installation CD, a source CD, and a bootable Tasty Morsels CD that does double-duty as a bootable rescue CD and a repository for still more applications. Because of changes to Power Macintosh hardware architecture, the bootable CDs won't boot older Power Macs–typically anything before the fruity iMac or blue-and-white G3.

Installation is about as straightforward as a Linux install can be. *Champion Server*, which uses a *Red Hat 6.2*-based core, also uses the *Red Hat* installer–clunky, but serviceable–and not for the faint of heart. After all, *pdisk* isn't the tool for newbies, especially Mac users used to the more eloquent *Drive Setup*.

Thanks to the remarkable consistency of Mac hardware, there's not a lot of guessing about device drivers at install, either–even non-standard devices such as a 3Dfx video card or Adaptec's 2940U2W Ultra2SCSI card worked just fine. This "it just works" phenomenon also includes USB devices–*Champion Server 1.2* handled a Microsoft IntelliMouse Explorer USB optical mouse with aplomb.

We did run into one difficulty during installation, and that was with X Windows–big surprise. X would run in the most basic 640x480 flavor, but that was all–until we ran *Xautoconfig*, a small utility that looks at the video card's frame buffer and generates an X configuration file. Plainly put, this widget kicks ass. It enabled 1024x768 resolution for us in a heartbeat, ending our struggle with *Xconfigurator*. You can download *Xautoconfig* at the following URL: http://dev.linuxppc.org/~trini/.

Between the three CDs, *Champion Server 1.2* ships with over 400 applications. (It also includes a few apps that aren't free, such as *CommuniGatePro* and *FrontBase*.) Most of these are standard fare, aimed primarily at a developer or server-based configuration. *Apache 1.3.12*, *Proftp 1.2*, *Samba*, *Netatalk*, *Sendmail*, and a host of other server applications are also included. *Champion Server* also plays nice with *FrontBase*, *MiniSQL*, and *MySQL*, if you'd like a choice of databases.

The distro can also be made into a respectable workstation quickly and easily. The crowning jewel for Mac geeks in *Champion Server's* cool app collection is *Mac-On-Linux*. This semi-complete emulator application lets you run the Mac OS (and its applications) in an X window. Because *Mac-On-Linux* is running on a Mac, it performs nearly as well as native Mac OS–it's difficult to tell the difference. It can handle versions of the Mac OS from System 7.5.2 all the way to Mac OS 9. There are a few things that still don't work in *Mac-On-Linux* emulation, including sound, serial ports, graphic acceleration support, generic SCSI, and removable media. Although you can't read or write EXT2 volumes from *Mac-On-Linux*, it's still quite handy, especially if you can't stomach the thought of rebooting into Mac OS just to run *Microsoft Word*.

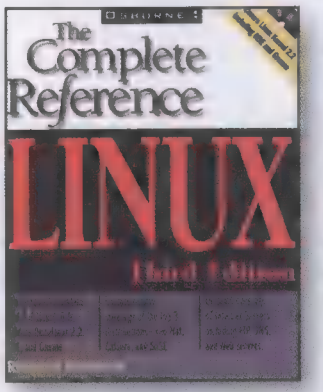
Champion Server 1.2 is a real winner. It's by far the most professional distribution in the PowerPC Linux world. Its *Red Hat* installer feels a little stiff and complicated after using one of the newer graphical installers with other distros, but once broken in, *Champion Server 1.2* is a well-trained companion.

–David Reynolds

MAXIMUM LINUX VERDICT

Price Free download; 3 CD set: $25, 3 CD set plus 60-day Web based installation support: $55
Company Yellow Dog Linux
Phone 360-896-9833
URL www.yellowdoglinux.com

Linux: The Complete Reference 3rd Edition



After you take a look at the size of *Linux: the Complete Reference, 3rd Edition*, you'll probably be asking yourself, "Do I really need another brick of a book?" Let's find out!

As evidenced by its name, this is indeed the third incarnation of this title, with author Richard Petersen doing a bang-up job of improving what was already a good book. *Linux: the Complete Reference, 3rd Edition* includes coverage of three top distributions: *Red Hat*, *Caldera*, and *SuSE*, along with extensive coverage of Internet services. There are also many chapters on software management using RPM, various editors, X Windows, KDE, and GNOME, and a large section on general systems administration, including file system administration, Samba, and network administration.

The original edition of this book was based on *Caldera* installation, and we noticed the same "*Red Hat/Caldera slant*" to this edition. Anyone running any flavor of Linux will find this book useful; however, we would have liked to see more information about *Debian* package management instead of sole focus on RPMs.

It's nice that the book gives you a choice of *Red Hat 6.0* or *Caldera OpenLinux 2.2*, both of which are bundled on CDs and included with the book. But at press time, both distributions were at least two versions too old. So, unless you have a high-speed Internet connection to get the updates, you'll probably want to pick up one of the popular multi-CD collections (or subscribe to *Maximum Linux* magazine) to get the current versions.

Overall however, *Linux: the Complete Reference, 3rd Edition* should satisfy your reading requirements quite nicely. –Dean Staff

MAXIMUM LINUX VERDICT

Price $40
Company Osborne/McGraw Hill
Phone 800.262.4729
URL www.osborne.com

HIGHS

- Covers more than a single distribution
- Easy to find what you're looking for
- Improves on an already good book

LOWS

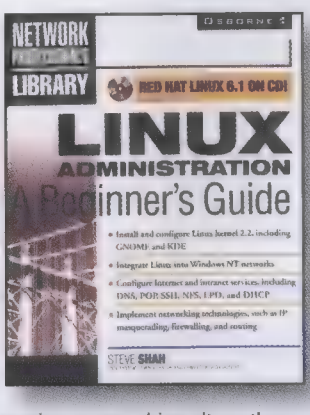
- The CDs with book are outdated (includes *Red Hat 6.0* and *Caldera OpenLinux 2.2*)
- Could have more info on distributions based on Debian GNU/Linux
- Need to see a chiropractor after carrying it for any length of time

Linux Administration: A Beginner's Guide

Don't let the "Beginner's Guide" in the title fool you; *Linux Administration: A Beginner's Guide* is not for computer neophytes. Actually, a more appropriate title would've been "*A Beginner's Guide to Linux*," since author Steve Shah makes the assumption that you're (a) familiar with Windows and (b) already have a basic understanding of networking under Windows.

We hope you do, because although there are now a plethora of Linux books on the shelves, not all are as well written and informative as this one. For starters, *Linux Administration: A Beginner's Guide* covers a broad range of topics. From installing Linux, to maintenance, to installing additional software, services, and hardware, to firewalls and the /proc file system, *Linux Administration: A Beginner's Guide* clearly explains how system administration under Linux compares to that of an NT system.

The examples used in the book are also useful and informative–a rarity these days. Shah explains how to install software by using Red Hat Packet Management (RPM), but, more importantly, he also covers compiling and installing software from the source code (let's see an NT sys-admin do that!). While other books sometimes deal only with installing and configuring a new system, *Linux Administration: A Beginner's Guide* also explains how to do things including adding, partitioning, and formatting a new drive altogether.



Frankly, this is a "must have" book for any aspiring "young" Linux sys-admin. –Dean Staff

MAXIMUM LINUX VERDICT

Price $40
Company Osborne / McGraw Hill
Phone 800.262.4729
URL www.osborne.com

HIGHS

- CD includes *Red Hat 6.1*
- Covers advanced topics such as compiling software from the source code
- Cool "Blue Print" insert to show how major systems functions differ from Linux to Windows NT

LOWS

- None!

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BROWSERS REVEALED

QUEST FOR THE PERFECT LINUX BROWSER

Ask the average group of Windows users what browser they prefer and watch a holy war unfold right in front of you. Ask the average group of Linux fans what browser they use and you'll likely hear "the source, _I've I've heard about the Godzilla thing."

Sure, Netscape has the Web's share of the Linux browser market, but there are a number of top-notch challengers. Whether you're motivated by speed, stable reliability, or the newest cool media goo to install in your Linux box, the goodies pursued that all will be possible in your future.

We look the top three current contenders: *Communicator*, *Mozilla*, and *Opera*, and beat on them with everything from streaming multimedia and XML to goos of HTML 4.0. Then we quickly and grabbed a bunch of the open-source systems and love everything wrapped with Tcl/Tk, too.

by Evan Eveland

Illustration by Jeremy Sheppard

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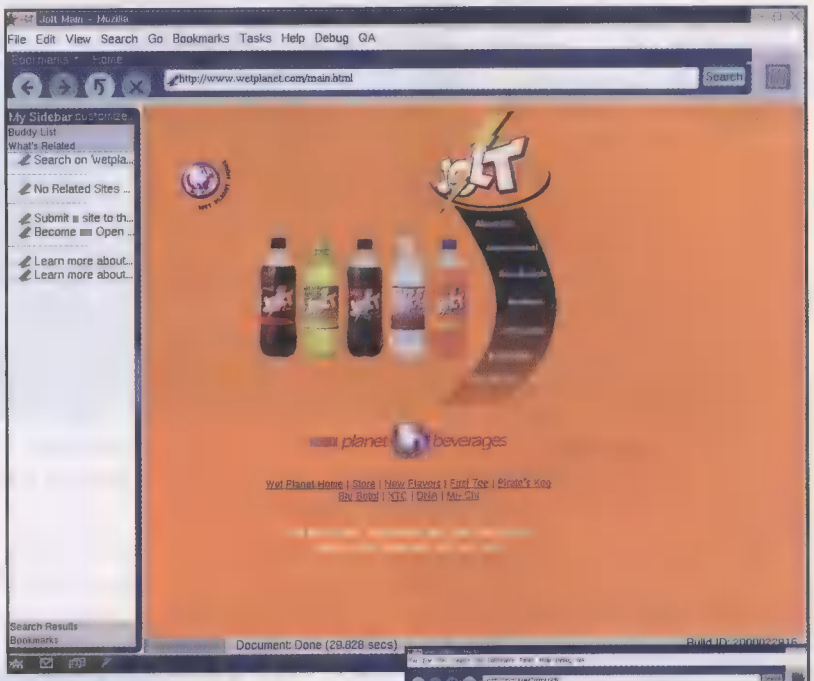
Mozilla M14

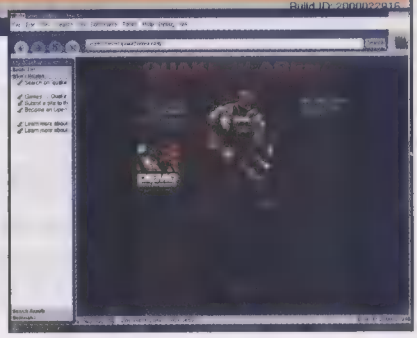
NOT READY FOR PRIME-TIME

When Netscape announced the release of the *Communicator* source code, dubbed *Mozilla*, in early 1998, expectations ran high. It's been a long wait, but with the release of *Milestone 14* (M14), *Mozilla* has become, somewhat surprisingly, very useable. Although still "pre-beta"–*M15* should be the first *Mozilla* beta–and lacking some key components, the future looks bright for the little lizard that could.



Once finished, M14 should provide a jolting Web experience.

For starters, the user interface isn't hard coded into the program. It's defined by a series of documents written in an XML-based User Interface Language, dubbed XUL. This controls the "skin" or visual appearance of the browser as well as the content of the interface and as such, is highly customizable. This allows for themes to be applied, new toolbars and menus to be added, old ones removed, and more. Very slick. The best part is that this flexibility extends beyond simple aesthetics. You could easily create a children's browser with big, colorful buttons and minimal menus. Or maybe a more high-tech version that would look right at home in the upcoming *Matrix* sequels. All of this customization is a good thing, because after you've taken your first look at *Mozilla's* godawful ugly default skin, you'll want to get started on a new one posthaste. If you're not the adventurous type, you can always browse around MozillaZine's chromeZone (http://www.mozillazine.org/chrome/) and take a look at some themes available for previous milestones. Sweet!



Thanks to its XUL-based code, M14 is extremely customizable. Way cool!

Mozilla's Gecko layout engine is also superb. Based on current open standards (HTML 4.0, CSS, XML, and DOM) this is the part of the browser that takes all of the Web content, formats it for viewing, and throws it back onto your screen. It's fast enough that the Gecko engine takes care of not only the Web content, but the user interface or "chrome"–the menus, toolbars, and other parts of the interface–as well.

Of course, all of this behind the scenes, free love and software, hot-tech stuff is fine and dandy, but how well does it work? Although Java's currently flaky under Linux, *Mozilla* does support the Open JavaVM Interface (OJI), meaning a JavaVM plug-in can be used. Unfortunately, there were no JavaVM plug-ins available in time for this review. *Mozilla* handles HTML, Javascript, XML, CSS, and DOM without a hitch, and is currently considered the most capable CSS browser out there. But beware: It's also slow, thanks to the debugging code and the fact that speed optimization wasn't a top priority for the folks at Mozilla.org.

Porn fans will no doubt cry foul over *Mozilla's* lack of support for passwords in the security dialog box, but this can, luckily, usually be circumvented with ye old http://username:password@www.naughty-site.com URL.

By adding support for multiple POP accounts, *Mozilla* also plugs the most irritating hole in Netscape's mail client. *Mozilla's* mail client handles HTML mail, attachments, and has a slick little address book to boot, but you'll have to drag out your dictionary since the spell-checker in the Linux version doesn't work. It may not be as polished as the *Navigator* mail client, but it's definitely useable. Unfortunately, the same can't be said for the news client, which, with no method for displaying newsgroups, sucks the big one.

Overall, *M14* just isn't ready for prime-time. It's buggy and missing too many features for general use. Still, that doesn't mean that you shouldn't take the time to download and play with it. Get a feel for it, ferret out some bugs, and enjoy what you can. (Seeing DHTML in action is worth the admission price.) There's no doubt that *Mozilla* will someday be your next browser. It just won't be your browser today.

HIGHS

- Open Source
- Standards compliant
- Awesome technology core

LOWS

- Still slow and buggy
- Needs work
- Weak plug-in support

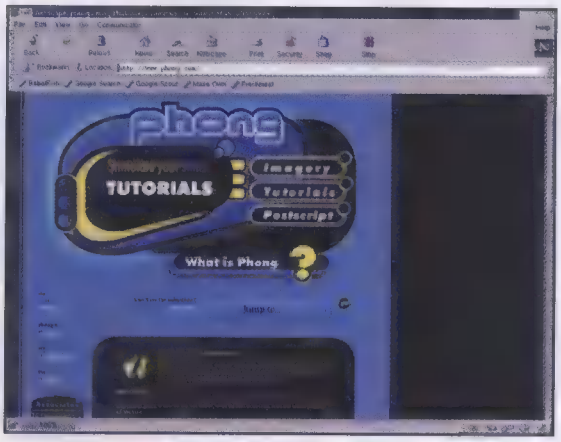
MAXIMUM LINUX VERDICT

Price Free!
Product Mozilla Milestone 14
Company Mozilla Organization
URL http://www.mozilla.org

Netscape Communicator 4.72

KING OF THE HILL ... FOR NOW

With nearly as many cool toys as its Windows cousin, *Communicator 4.72* sits atop the pile of Linux browsers. *Communicator* comes with an integrated e-mail client, newsgroup reader, an HTML editor, and excellent plug-in support. With a little work (see our "Mutimedia Madness" sidebar on page 48), you can have all the multimedia sweetness you desire, whether you're downloading new MP3s for your office computer or doing video research at www.linux-hotties.com. The downside to all this is a 16MB download, sluggish performance, and too many crashes for comfort.



It may have its share of problems, but 4.72 still rocks.

The browsing component of *Communicator* is the most feature-rich of the current Linux offerings. At the heart of *Communicator* is *Netscape Navigator 4.08*, and all the goodies you've come to expect from a browser are here. Javascript support is the best in the business, and while the JavaVM is somewhat buggy, it does the job. Secure transactions are handled by the SSL protocol with a 128-bit version also available. *Communicator* renders standard HTML well, but chokes on dynamic HTML (used to define funky pages that allow for animated text and changing content). Cascading style sheets, XML, and DOM support is fairly limited (see the sidebar "How We Tested"), but some of the other features are just too cool. Type **stock AOL** and you'll be viewing the current stock info. Type **about:cache** and you can browse the disk cache. Type in **zip 90210** and get all the interesting details of Beverly Hills (the city, not the cancelled TV show). And yes, the Shop@Netscape button lets you browse the Netscape store. Ahh, visions of capitalism.

But what's an Internet suite without e-mail? *Messenger* does an admirable job of both e-mail and newsgroups. With support for filters, spell-checking, HTML e-mail, and attachments, there's little need for a separate e-mail client. The address book keeps detailed information and allows the import and export of lists. *Composer* is a straight-forward HTML editor, with the exception of a spell-checker.

Communicator 4.72 isn't perfect–setting up plug-ins is way too much work, it'll crash fairly regularly, and it's sluggish–but it's still the best Internet suite currently available.

In short, *Communicator* is more like jacked-up monster truck with KC lights and tractor-trailer tires than an undulating magic carpet. Sure, it's hell of ride–just don't expect it to be smooth cruising all the way.

HIGHS
- Great plug-in support
- Solid Java support
- Built-in e-mail, news, and address book

LOWS
- Buggy
- Huge download
- Poor adherence to standards

MAXIMUM LINUX VERDICT

Price Free!
Product Communicator 4.72
Company Netscape Communications
URL www.netscape.com

Netscape 6 Preview Release 1

AN EARLY EVALUATION

After what seemed like years, *Netscape* has finally released the follow-up to its 4.x family of browsers. And like its *Mozilla* cousin, we have the same support for standards along with a butt-ugly interface. So why the jump from version 4 to version 6? Well, the code that became the *Mozilla* project was early *Netscape 5* code, and since *Internet Explorer* is up to 5.5 these days...

Netscape 6 adds AOL's Instant Messenger, the Personal Security Manager, a cookie manager, and some spiffy *Netscape* online tools. Personal Security Manager lets you play with security settings, certificates, and other paranoid little goodies, while the cookie manager lets you view info on any cookies present in your system, as well as block specific sites from using cookies. AOL's *Instant Messenger* shows up for all your messaging needs, but since AOL owns the highly popular ICQ, we wonder why ICQ wasn't integrated as well.

The mail and news client is similar to the *Mozilla* version and supports multiple mail accounts. A cool new additon is the "collected addresses" feature, so when you receive an e-mail message, the address of the sender is automatically added to your collected addresses folder. Other goodies include translation, calander, and search buttons.

Our biggest gripe at this time is the inability to specify a non-AOL/*Netscape* search tool. The default search tool is

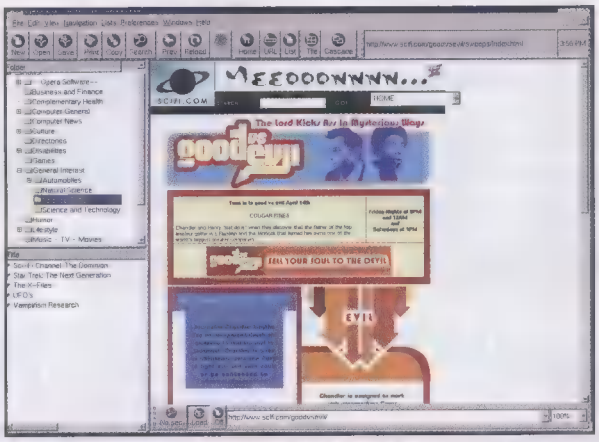
HIGHS
- Standards compliant
- Personal Security Manager
- Instant Messenger

LOWS
- No Java support
- RAM hog
- Poor plug-in support

Opera 4.0a Tech Preview 2

PRE-ALPHA EXCITEMENT

Who else has the cojones to put "Netscape Now" and "Free MSIE" buttons on its download page? Who else is porting its software to everything from BeOS to OS/2 to MacOS? Who else is charging for a browser? Opera, that's who. What started as an in-house intranet application for the Norwegian Telecommunication Company, *Opera* has become the browser of choice for Windows power users. Now this small, sleek, and hella-fast chunk of code comes to the Linux world. While obviously not completed, the speed and design of this pre-alpha software will not disappoint.



It may not be complete yet, but Opera is a speed demon.

The download is relatively large at just over 2MB, portly for an *Opera* release. Expect this to dip under 1MB when the final release is out. But make no mistake, *Opera* is fast. How fast? On a non-cached page it consistently loaded pages as fast as Navigator 4.08 and 3.04, handily beating *Mozilla M14*. Only *Lynx* and *w3m* (both text browsers) consistently outperformed it. The speed difference was not as great as that noted under Windows, but continued development will no doubt yield faster downloads. (For real speed, toggle off image loading–a handy button on the status bar.)

Customization has been a long-time feature of *Opera* on the Windows platform. *Tech Preview 2* is no exception. Menus can be moved or removed, custom fonts applied, and document settings toggle on/off. In addition, all the taskbar buttons are simple GIF images.

Within an hour in *Gimp* we had Tux as our home button, GNOME feet as navigation buttons, and all the other buttons looking very much like Afterstep. Pretty sweet.

Implementation is where *Opera* tends to leave others in the dust. Multiple browser windows can be opened in the same session. The top menubar controls the active window. Buttons controlling image loading and document settings sit next to the status bar of each window. *Opera* is also striving for compatibility with open Internet standards such as HTML, CSS, and XML. Frankly, we can't wait for the day when *Opera* integrates such other features as window zooming, full keyboard navigation, integrated mail, and news, as well as plug-in and Java support.

While not nearly complete enough for serious use, this *Opera* preview release offers a glimpse of what future versions have in store. Don't let our verdict throw ya–this alpha software is rated as-is. However, if it shapes up as planned, it'll be a major contender to the coveted *Mozilla/Navigator* throne.

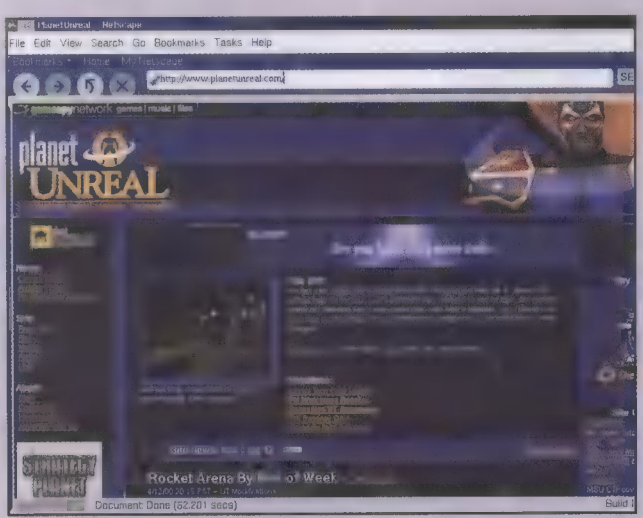
Frankly, we can hardly wait.

HIGHS
- Fast
- Small download
- Highly customizable

LOWS
- Closed source
- Pre-beta
- No plug-in or Java support

MAXIMUM LINUX VERDICT

Price free; final release $35
Product Opera 4.0a Tech Preview 2
Company Opera Software A/S
URL www.opera.com/linux



For an early beta, Netscape 6 is definitely a winner.

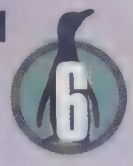
"powered by Google," but why not let us use Google in the first place? Other caveats include *Composer's* capable–but buggy–HTML tool, and lack of a JavaVM plug-in.

Netscape 6 may claim the title of the "most hyped beta project" ever. Go to Netscape's site and take a look around. *Netscape 6* is being pumped out to a ton of people with very few references to the "Preview Release" part. Linux users tend to be a more tech-savvy crew with experience with beta software, but we're hoping that the current experience doesn't sour potential converts.

Netscape 6 is a heck of a browser for an early beta. Expect awesome things as the code is refined and people jump on the XUL bandwagon. Compared to Mozilla, it's a hair faster, a hair buggier, and a more memory hungry. But it's definitely on the right track.

MAXIMUM LINUX VERDICT

Price Free
Product Netscape 6 Preview
Company Netscape Communications
URL www.netscape.com



ALL THE REST

Not to be outdone by the big boys, there are quite a few underlings available. Here are some of the other offerings for Linux:

Amaya 2.4

http://www.w3.org/Amaya/

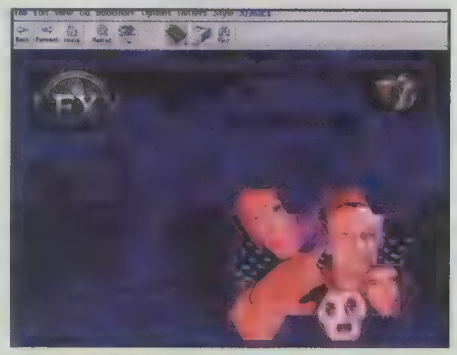
Amaya is the W3C's Web browser/HTML editor. Designed to test new implementations of Web protocols, it supports HTML 4.0 and CSS. The WYSIWYG editor is excellent for pure HTML and the user interface is attractive. FTP isn't supported, and it refuses to recognize a Web page address unless the "http://" tag is used. Plug-in support has to be compiled from scratch, and there isn't default support for Java or JavaScript. *Amaya* makes a good HTML editor, but a poor browser.

Maximum Linux Verdict 5

Emacs/W3

www.cs.indiana.edu/usr/local/www/elisp/w3/docs.html

What do you get when you take *Emacs* and write a Web browsing component in *Emacs-Lisp*? The evil son of *Emacs* – *Emacs/W3*. *Emacs* fans will be the main audience here since there's no support for Java or JavaScript. The browser tends to be slow and has some problems with password-protected sites. While an interesting view of what's possible with *Emacs-Lisp*, most will want to look for a more complete Web client.



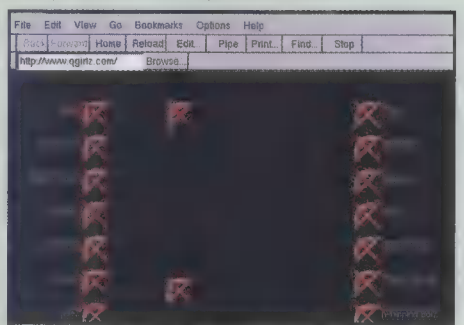
***Emacs/W3* is not a complete Web client.**

Maximum Linux Verdict 4

Express

www.gnome.org/applist/list-martin.phtml?catno=5

Express is billed as an Open Source browser written for the GNOME project. It aims to use extensive plug-in support for most functions, including viewers, socket layers, and protocols. This looks to be a sound approach and will be worth keeping an eye on. At this early stage it can be summed up in two words: Segmentation Fault.



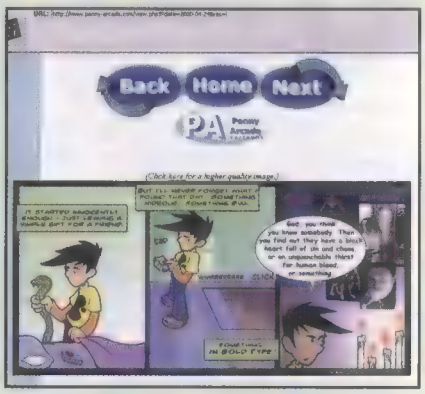
***Express* is still in a very early stage of development. Still, keep an eye on it.**

Maximum Linux Verdict 2

Grail

www.python.org

At first glance *Grail*, a Python browser, looks promising. The interface is attractive and intuitive. Unfortunately all the fun stops when you attempt to load a page. *Grail* is slow. Really, reaallyy slow. It's slow loading and slow opening pages. That's a shame because *Grail* offers some cool features. An I/O status panel displays all transactions between you and the server. Netscape bookmarks are automatically loaded and Grail's bookmark viewer/editor is superior to Netscape's own. Java and JavaScript are not supported and HTML 4.0 support is spotty at best. While an interesting example of the power of Python, *Grail* needs a speed boost from a higher power.



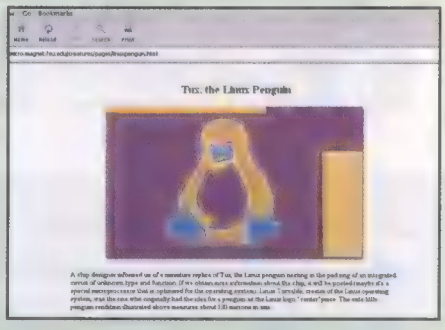
***Grail* is slow, but cool.**

Maximum Linux Verdict 4

HotJava 3.0

www.sun.com

HotJava, a pure Java browser from Sun Microsystems, is an interesting look at a stand-alone Java application. Unfortunately, frequent crashes and load times on the wrong side of a snail's pace make this little more than a novelty. The browser supports HTML 3.2, FTP transfers, JavaScript and, obviously, Java. Most HTML 4.0, CSS, and XML failed miserably. Mail can be sent, although the client is lacking an address book, spell-checker, or support for multiple servers. Mime types are supported via external applications. What makes the browser unusable is the lack of speed. Compared to Navigator 4.72, simple HTML pages loaded in nearly twice the time. Add in frames and other images, and you'll think it crashed. HotJava is one of those things you really want to like. On a Java-capable thin client or for consistency across multiple platforms, HotJava might make sense. For the Linux user, it's simply been done better.



We'd like to recommend *HotJava 3.0*, but we can't. It's just too slow to use.

Maximum Linux Verdict 4

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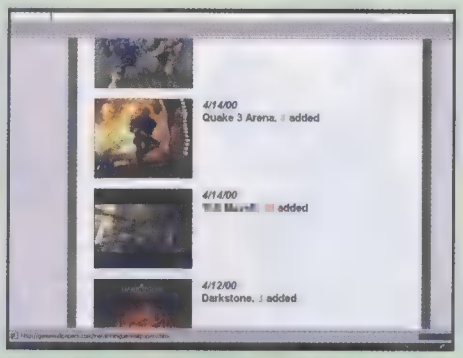
Internet Explorer

www.microsoft.com



Using *Internet Explorer* can be fun, but it's not really recommended for real browsing.

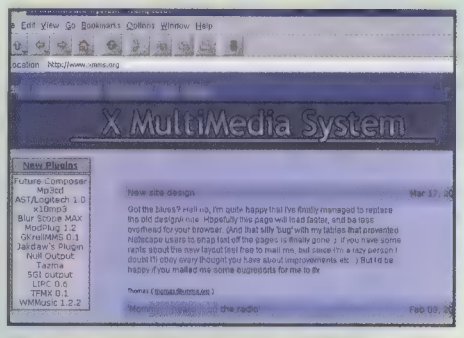
No, we're not on crack here. We're talking about running *Internet Explorer* under Wine. Yes, it does work. Yes, it's buggy. And yes, it looks like crap (more so than usual). Direct input of a URL didn't work as often as it worked, page refresh is poor, and JavaScript, well sucks. So why on earth use it? One, it somewhat destroys the whole "part of the Operating System" argument. Second, if you find yourself behind an Microsoft proxy server that blocks non-MS clients, you don't need to grab that Win2000 CD. Fun, but not real functional.

Maximum Linux Verdict 2

kfm/konqueror

www.kde.org

The K desktop environment file manager serves double duty as an HTML browser. If you're not looking for the full-bore multimedia experience, this little guy can be a pleasure to use. But with no Java, no JavaScript, no XML, no CSS, poor HTML 4.0 support, what's there to love? Stability. We tried really, really hard to crash this thing. No go. When it runs up against something it can't render, it just ignores it. No muss, no fuss. It's ideally suited for browsing local HTML files. Unfortunately, there are no browser-specific commands. This means that to download a file you have to right click and copy it, then open the destination folder, and right click to paste it. Look for *konqueror*, the replacement for *kfm* in KDE 2.0, to solve most of the deficiencies in *kfm*. *Konqueror* adds URL auto-complete, JavaScript, Java, and much improved XML and CSS support. While not the most feature-complete offering, *kfm/konqueror* offers speed and stability to the KDE user.



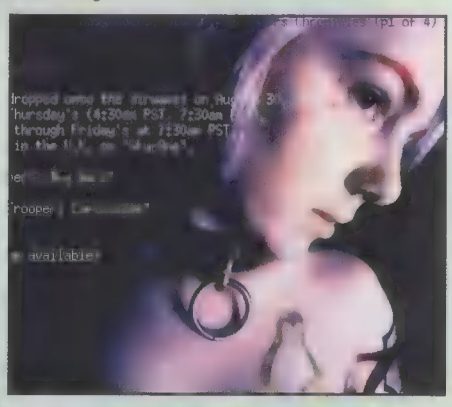
There's no support for Java, XML, or CSS, but dang... this one refused to crash!

Maximum Linux Verdict 7

Lynx

www.lynx.browser.org

The original text browser, *Lynx* is first and foremost a speed demon. *Version 2.8.3* absolutely chews through Web pages. While it doesn't handle frames, it can display the individual frames. Controls are intuitive and easy to use. Overall, *Lynx* is a good package–it just has the misfortune of being overwhelmed by w3m.



***Lynx* moves more like a cheetah.**

Maximum Linux Verdict 6

Comparison Chart

So what browser is in your future? We've put together a feature list of the top four contenders to help you decide. Look for the landscape to change with the official release of *Netscape 6.0* and the full version of *Opera*. Ahh…what a wonderful time to be a Net-savvy penguin!

	Netscape Communicator 4.72	Mozilla M14	Opera Tech Preview 4.0a	Netscape 6.0
HTML 3.2	Good	Excellent	Excellent	Excellent
HTML 4.0	Fair	Excellent	Good	Excellent
CSS	Fair	Excellent	Good	Excellent
XML	No	Yes	Yes	Yes
Java	Excellent	Not Currently*	Not Currently	Not Currently
JavaScript	Excellent	Excellent	Not Currently	Excellent
SSL	Yes	Yes**	Not Currently	Yes
Plug-In Support	Yes	Not Currently	Not Currently	Not Currently
Mail/News Client	Yes	Yes	Not Currently	Yes
Open Source	No	Yes	No	No
Price	Free	Free	Free/$35	Free
Verdict	8	6	5	6

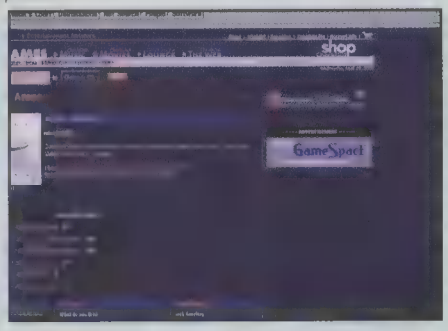
*Supports the Open Java Interface, just waiting for a Linux OJI Plug-In

**The PSM or Personal Security Manager 1.1 for Mozilla adds cryptology to Mozilla M14. See http://www.iplanet.com for details.

Navigator 3.04

www.netscape.com

Netscape offers more than just the newest 15+ MB behemoth on its site. Good ole *3.04* can be found in the archive as well. Why a step back in time? How about a smaller download, quicker browsing, and decent stability? Toggle images off, and you've got a speedy search client that won't hiccup when it runs into frames.



Sometimes living in the past can be a good thing. At least, we think so!

Maximum Linux Verdict 5

NCSA X-Mosaic

www.ncsa.uiuc.edu/SDG/Software/Mosaic/

Mosaic, developed by the National Center for Supercomputing Applications, was initially released in December of 1992 by Marc Andreessen, who went on to form a little company called Netscape Communications. *Mosaic* is considered the granddaddy of Web browsers. Development officially ended in early 1997. As such, the browser is not a current contender in the browser wars, but maintains historical interest.

You didn't think we'd forget about this one did you?

Maximum Linux Verdict 3

StarOffice

www.sun.com

Sun Microsystems' *StarOffice* suite offers HTML browsing in addition to its laundry list of features. With the appropriate Java runtime environment (JRE) it supports Java and JavaScript. Support for HTML 4.0 and CSS is good, but not complete. While somewhat slow to load images, it's still rock solid. One cool feature: Right click on a picture and you can add it to *StarOffice's* clip-art directory. To copy the file locally, highlight copy and not as link under "Add Picture". Some other nice touches include toggling image loading and entering edit mode or viewing HTML source with a right click. The ability to view a Web page in WYSIWYG editing mode is particularly useful for those new to Web page design. The downside includes a 68MB download, slow page loading, and poor plug-in support. While obviously geared towards Web page design, the browsing ability of *StarOffice* is one more reason this suite is a must-have.

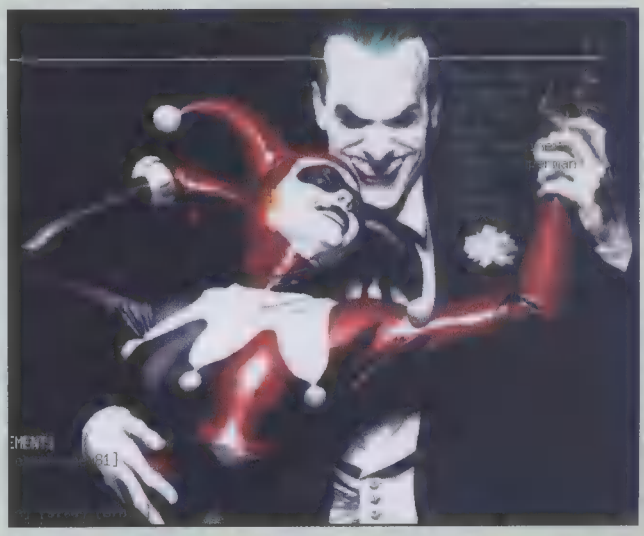
While somewhat slow to use, *StarOffice* is still rock solid nonetheless.

Maximum Linux Verdict 6

W3M

ei5nazha.yz.yamagata-u.ac.jp/~aito/w3m/eng/index.html

w3m is a text based browser similar to *Lynx*. Like *Lynx*, it's extremely fast. Unlike *Lynx*, this thing handles frames. Woo hoo! When confronted with a page containing frames, typing "F" renders the frames in a table. This could be love. Inline images can be saved to disk or launched in the default viewer with a keystroke. An external browser can be launched to view the current page or a link. Tables render much better than *Lynx*, and page sources can be viewed. We could go on, but the features are killer. The only real complaint is that some of the key mapping isn't intuitive. Other than that, *w3m* rocks.



***W3M* handles frames and it's fast. What more do you want?**

Maximum Linux Verdict 7

So, there you have it. A slew of browsing choices. While none mounts a monstrous challenge to *Navigator* at this point in time, each clearly has its own merits. Now warm up the modem, grab some bandwidth, and try a few out. You might just be surprised by what you discover.

MULTIMEDIA MADNESS

You've got the newest, sweetest version of Netscape. You've heard the cool descriptions of WinAMP, RealPlayer, and Flash. Maybe you're even one of those masochists who yearns for AOL's Instant Messenger. You fire up your trusty portal to the Internet and get...nothing. No friggin Flash. No

Macromedia Flash

Macromedia has finally ported its *Flash* player to Linux. This install is fairly straightforward. Connect to Macromedia's site and look for that big "Get Flash" button. It's hard to miss. Once clicked, it should auto-detect Linux. Download the file (it should be called "flash_linux.tar.gz".) Now, untar the sucker with **tar -xzf flash_linux.tar.gz**. This will unpack three files into a subdirectory called Linux, so change to that directory by typing **cd Linux**. Next, copy the plug-in files into your ./netscape/plugins directory with **cp libflashplayer.so $Home/.netscape/plugins** and **cp ShockwaveFlash.class $Home/.netscape/plugins**. Test it by opening up Navigator and typing the following about:plugins URL.

You should see an entry for ShockwaveFlash. Rejoice! *Flash* is installed. Now head back to Macromedia's site for some links to cool *Flash* -enabled sites.

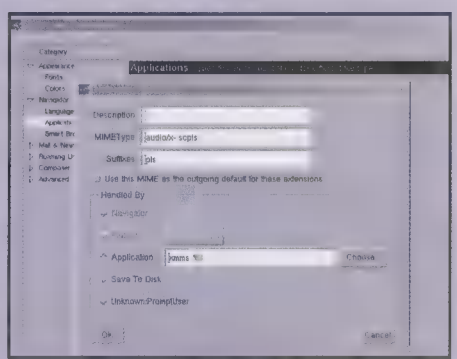
Blackdown Java

Why add Java as a plug-in instead of using the Java VM that ships with *Navigator*? One, because you can. Two, we found Blackdown's *JVM* to be more stable. This one's easy, as well. Connect to http://www.blackdown.org and click the download link. Find a mirror site close to you and hop on. Enter the JDK-1.2.2 directory and choose your platform (i386 for PC users). Then go to the RC4 directory. OK, download the file JavaPlugIn_1.2.2.px.sh. Now we need to make it executable, so type **chmod +x JavaPlugIn_1.2.2.px.sh**. Then run it with a simple **./JavaPlugIn_1.2.2.px.sh**. Agree to the lengthy license, and it installs in your home directory. It should then open a page in *Navigator* (assuming it's running) letting you know it's installed.

Adobe Acrobat Reader

We can't leave all those precious .pdf files out in the cold, so head on over to http://www.adobe.com and look for the purty "Get Acrobat Reader" button. Choose Linux as your platform and don't check the "include option for searching PDF files" 'cuz it's not supported under Linux. Now, download **acroread-4.0-2.tgz** (the numbers may change) and extract it to the root directory with **tar --directory=/ -xzf acroread-4.0-2.tgz**. Test the reader by typing **acroread**. This should bring up everybody's favorite document viewer. Adobe provides a shell script to integrate with *Netscape*, but we've found it pretty much sucks. Instead, copy the appropriate files with **cp /usr/lib/Acrobat4/Browsers/intellinux/nppdf.so /$Home/.netscape/plugins** (remember: $Home should be replaced with your home directory.) Fire up *Netscape* and do the *about:plugins* to verify that it's installed. If you get an ugly error about a missing "libc.so.5" read on. Type **ls /lib/libc*** and look for something along the line of "libc-2.1.2.so". That's our guy. Make a link for it with **ln -s /lib/libc-2.1.2.so /lib/libc.so.5**. Try loading *Netscape* again. It should now show a very happy "nppdf.so" plug-in. We're outta here!

XMMS



***XMMS* is great for MP3 fans. Long live Napster!**

Now for some fun stuff. *Xmms* is a pretty standard MP3 player. It has the nice feature of handling steaming MP3s well. If you're a big *FreeAMP* fan, you can use that instead. OK, first test that you have it. Type **xmms**. This should bring it up. If not, head over to http://www.xmms.org and grab it. It's available as source or binaries and is straightforward to install. Just follow the directions given on the site. Now open up *Navigator* and click on **Edit -> Preferences**. This will bring up, you guessed it, the preferences box. Under the "Navigator" tab select **Applications**." Here is where *Navigator* keeps the list of what application or plug-in handles what file type. We're going to add four types for *Xmms* to handle. Click on new and enter the following types:

Mime Types	Suffixes	Handled by
Audio/x-scpls	pls	Application: xmms %s
Audio/x-mpegurl	mpu	Application: xmms %s
Audio/mpeg	mp3,mp2,mpega	Application: xmms %s
Audio/x-mpeg	mp3,mp2,mpega	Application: xmms %s

The description doesn't matter, but the rest does, and it's case sensitive. The "%s" after "xmms" tells it to stream the audio. To test, head over to your favorite MP3 site. Streaming MP3 lovin' straight to your Linux box. Life is good. Very good.

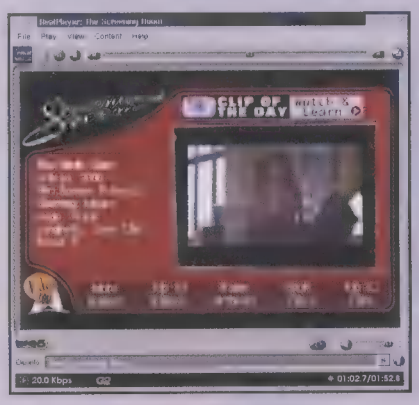
RealPlayer 7

RealPlayer 7 is out for Linux. And it rocks! Head over to http://www.real.com and look for the "RealPlayer free" button. Then click the *RealPlayer* 7 basic button, fill out the form, and select *Red Hat Linux 6.0*. We used the non-RPM. Make it executable with **chmod +x rp7install.bin** and run it with **./rp7install.bin**. Select the default directory (if you change it, just substitute the directory you used for /usr/local/RealPlayer7) and click finish. Now we get the option to install a *Netscape* plug-in.

RealPlayer. No streaming anything. What's a Linux user to do? Take heart, trusty companion. We're going to run through trickin' out your browser for the latest goodies. Pick and choose the apps you like or go for broke and install it all.

Note: *When we use $Home/ we're [illegible] the [illegible] home [illegible] your home [illegible] is /home/CherylAnn then [illegible]*

[illegible] these programs are on the disc! You [illegible] routines in case a new version [illegible] available!



RealPlayer 7 rocks! 'Nuff said.

Sweet, even if it only does half the job. The Plugin Helper Softlink is any directory in your path, so we used /usr/bin. Click **Finished -> Next ->** and **OK**. Now fill out the user info (note: the connection speed defaults to 10Mbps LAN, so you'll want to select your speed) and listen to the cute demo. Now we're set, but Real leaves out no less than 5 MIME types. Ouch! Open up *Navigator* and click on **Edit -> Preferences**. Under the "Navigator" tab select **Applications**. We're going to add five types for *RealPlayer 7* to handle. Click on new and enter the following types:

Mime Types	Suffixes	Handled by
Application/vnd.rn-realmedia	rm	Application: /usr/local/RealPlayer7/realplayer %s
Application/smil	smi	Application: /usr/local/RealPlayer7/realplayer %s
audio/vnd.rn-realaudio	ra,ram	Application: /usr/local/RealPlayer7/realplayer %s
audio/x-pn-realaudio	ra,ram	Application: /usr/local/RealPlayer7/realplayer %s
video/vnd.rn-realvideo	rv	Application: /usr/local/RealPlayer7/realplayer %s

To test it out, open *Navigator* and head to http://www.real.com. Click one of the top movie trailers and enjoy!

IBM Techexplorer

This one's for the geeks. This adds TeX, LaTeX, and MathML support. Go to http://www.ibm.com/software/gmi/ and select **techexplorer Hypermedia browser** under products. Click the download link and follow the steps. Step 5 takes ya' to the download area. You'll need to register with IBM, but it's free and relatively painless. Accept the license and download the **te251introlinux.tar.gz** file. Copy it into a temp directory by typing **mkdir $Home/temp** and **cp te251introlinux.tar.gz $Home/temp** (remembering that $Home is really your home directory). Now extract it with **tar -xzf te251introlinux.tar.gz** and run the setup program **./setup**. Agree to the license, select personal or shared install, and point it to your *Netscape* directory (usually $Home/.netscape). It'll then ask for tar and mv command locations. Enter right through these. That's it. Fire up *Navigator* and type **about:plugins** as a URL and verify you have the IBM techexplorer plug-in. That's all folks.

Plugger

Plugger is just darn cool. It uses helper software (*mpg123*, *mtv*, *TiMidity*, etc.) to play various formats, including MPEG, AVI, QT (but not the newest Quicktime format–which is used for the X-Men trailer), and WAV files. Head over to http://fredrik.hubbe.net/plugger.html and check out the directions. It's a really, really good idea to get the players up and running before you install *Plugger*. We grabbed *xanim*, *mtv* (follow the MpegTV link), *TiMidity*, and *mpg123*. You may want to check to see if these were preinstalled with your distro. Especially *xanim*. It rules, but is a pain in the butt to install. Now assuming you've got the appropriate helpers installed, installing *Plugger* is a snap. Download it and extract it with **tar -xzf plugger-3.2-linux-x86-glibx.tar.gz**. (The filename may vary.) Change to the plugger directory by typing **cd plugger-3.2** and type **make** and **make install**. This installs the plug-in file "plugger", so cruise to the directory /usr/local/lib/netscape/plugins. Fire up *Netscape* and use the **about:plugins** URL to check that it's installed. Some of the MIME types may be disabled if you've installed *xmms* or *RealPlayer*. Head to the *Plugger* testing grounds at http://fredrik.hubbe.net/plugger/test.html. That's all there is.

AOL Instant Messenger

OK, hell *has* frozen over. Cruise on over to ftp://ftp.newaol.com/aim/java/ and snag the **aim_1.1.19_linux.sh file**. Make it executable with **chmod +x aim_1.1.19_linux.sh** and run it with **./aim_1.1.19_linux.sh**. Await the apocalypse. Copy the newly formed aim directory somewhere nice (we used $Home/) and invoke evil with **$Home/aim/aim**. Yeah, we know it's not a plug-in, but it is in *Communicator 4.72* for Windows so...

How We Tested

All [illegible] from their [illegible] sites [illegible] the [illegible] test [illegible] were [illegible]

Machine One

Pentium III [illegible] 128MB [illegible] Voodoo3 3000, [illegible] over Using Creative [illegible] XFree86 [illegible]

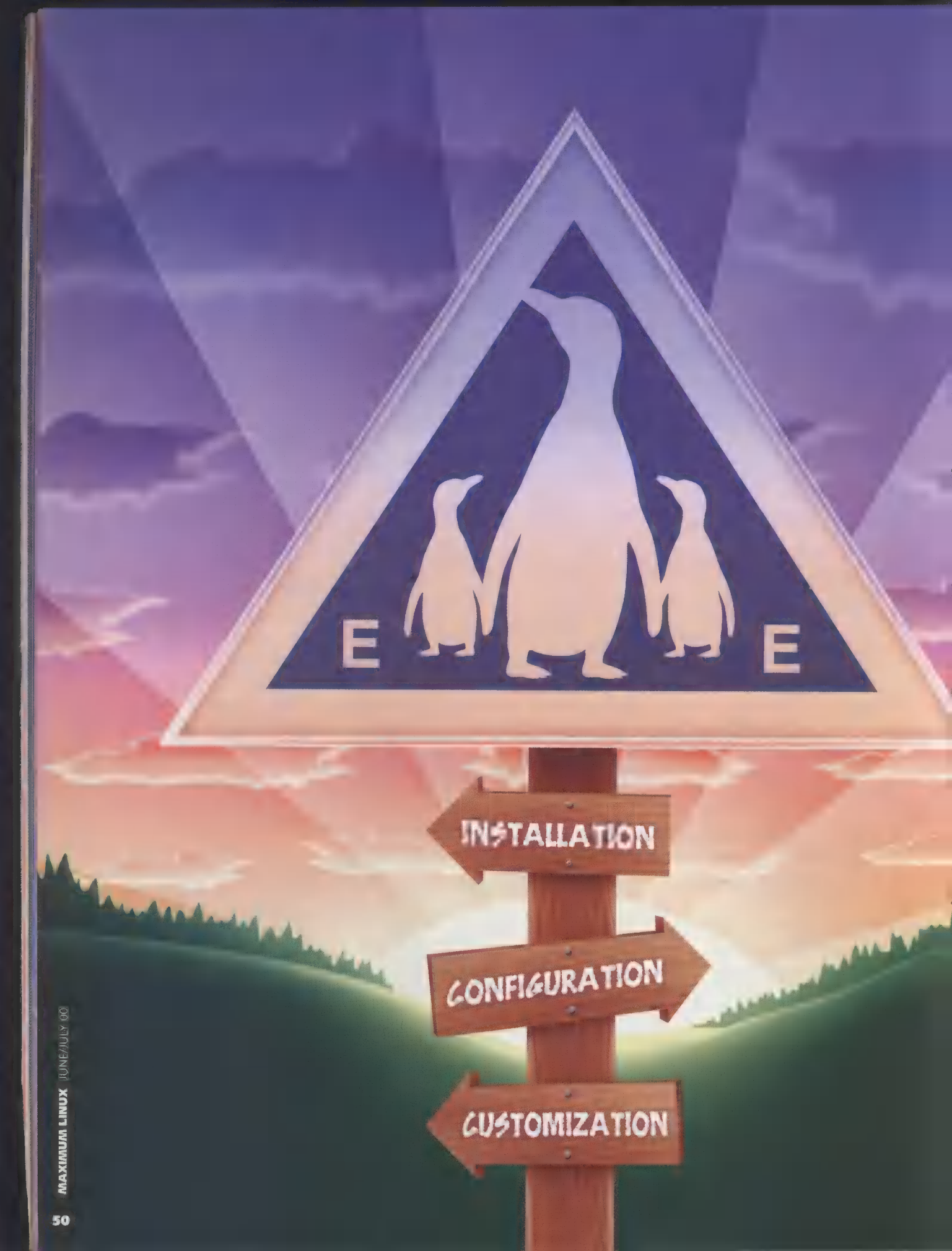
Machine Two

[illegible] 64MB [illegible] SB Awe [illegible] JDK 1.2

[illegible] were then [illegible] standard [illegible] out [illegible] ited to the following:

The Evil [illegible] Suite [illegible]
W3 [illegible] [illegible]
HTML [illegible] [illegible]

There you have it. Everything you need to trick out your browser to the fullest. But don't stop there. Hell the fun of Linux is fooling around with things. Try out different players. Add different viewers. Have fun. It's your box–make the most of it!


E
E
INSTALLATION
CONFIGURATION
CUSTOMIZATION

ON THE ROAD TO ENLIGHTENMENT

TAKING A TOUR THROUGH E

BY JOSUÉ BATISTA

Welcome to *Maximum Linux's* escorted tour through the virtual space of graphical interfaces and window managers. Since this tour is fully booked, all passengers are limited to one checked bag and one carry-on. Passengers with PCs running Linux are guaranteed priority seating and window views.

During today's excursion, *Maximum Linux* tour guides will be on hand to provide you with an introduction to the *Enlightenment* window manager, a.k.a. *E*, and inform you of its many customizing features! By the end of today's journey, you'll have an intricate understanding of the basic steps in obtaining the newest source files, tips for installation, and directions to customize *E* and make it your own.

Thanks for riding with us today. Fasten your seatbelts, and get ready to be enlightened.

First, a brief history...

In ancient times (back in the mid-80's), MIT began developing several components to facilitate Windows-based graphic output on a variety of bitmapped displays. Their development efforts produced what is now known as the X Window System, or simple "X" (http://www.x.org/), a graphical interface the UNIX world quickly adopted as a standard.

The X Window System model is not OS dependent and quite simple, using the "divide and conquer" approach. At the top of the chain are the X Servers, which interact directly with your video card and monitor settings. The next peg down contains window managers, taking care of basic graphical rendering and user interactions such as mouse clicks, with desktop environments bringing up the rear by providing consistent graphical organization and utilities. X is very much like a collection of Lego blocks—easily snapped together, minus the rainbow of colors.

Linux inherits from the UNIX world a non-OS dependent model to provide graphical interfaces. The Linux version of the X Server is called *XFree86* (http://www.xfree86.org/). At its core, *XFree86* provides the low-level interaction between video cards and monitor types, and also controls the X window display resolution, refresh rates, and color depth. To a certain degree, the X Server supports some basic window management, such as displaying and closing windows, keystrokes, and mouse interaction. Commercial X servers are also available for Linux, including *Metro-X* (http://www.metrolink.com/) and *Accelerated-X* (http://www.xinside.com/).

Enlightenment, or *E* for short, is the brainchild of Carsten Haitzler and Geoff Harrison. Their development work started back in 1996 as a response to demand for a better user graphical interface. Most of the original work was based on the *FVWM2* window manager. Since then, *E* has been completely rewritten and many features have been added. At press time, the most recent version is DR 0.16.3 (Development Release 0.16.3). Even thought *E* is at a pre-release stage, it was considered stable enough to be included in several recent Linux distributions, including *Red Hat* and *Mandrake*.

ILLUSTRATION BY PAUL JOHNSON

Buckle Up For Safety

Prerequisites for installing E

To get E up and running, it's very important to have a working X server in your Linux system. If you performed a standard installation of Linux, then *XFree86* should already be installed and configured. You should also have a basic window manager in place, such as *FVWM* or *fvwm95*. If you have a desktop environment up and running, such as KDE or GNOME, then you already have the basics necessary to install the latest version of E. Rejoice!

Since *Enlightenment* is the default window manager for the GNOME desktop environment, it's a good idea to install GNOME, if you haven't already. You can also run *Enlightenment* alone, on top of *XFree86*, but a desktop manager makes navigation much simpler.

Your Linux distribution should have the RPM files you'll need:

gnome-audio-1.0.0-4
gnome-core-1.0.4-8
gnome-games-1.0.2-8
gnome-libs-1.0.5-5
gnome-linuxconf-0.22-2
gnome-users-guide-1.0.5-2
gnome-utils-1.0.1-6

You may also need the following files to install GNOME:

xscreensaver-3.09-8
libgtop-1.0.1-3mdk.i586.rpm

If you're not running *Red Hat*, the GNOME Web site (www.gnome.org) has all of the installation files you'll ever need–including the requisite gzip'd files. We also included these files on this month's disc!

GZIP/GUNZIP

gzip is a utility program commonly used to compress files for storage and distribution. The usual extension for gzip-compressed files is **.gz**, but they can also have an extension of **-z** or **.z** too. Compressed files can be restored to their original format using the command **gzip -d** or **gunzip**.

The easily quoted executable files created by *gzip*, *pgp*, *compress*, or *pack*, and automatically determine the type of file you're compressing.

Command for compressing:

$ gzip -v file1 file2 > foo.gz

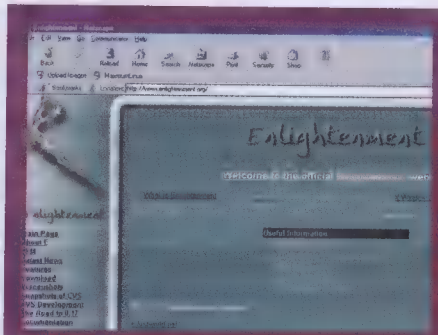
Command for uncompressing:

$ gzip -d foo.gz or **gunzip foo.gz**

Boarding Procedure:

Obtaining E Installation Files

Now, if the CD that came bundled with this issue of *Maximum Linux* wasn't ripped off by a predatory postal worker or mangled in transit to your favorite newsstand, you've already got the latest version of *E*. Or, at least we hope so. Although we've tried to provide the latest and greatest version for ya, it's possible that another update was released while this hot little magazine was at the printer. Just in case, we thought we'd tell you where to go–to get the latest version that is. To no one's surprise, the main source for the *E* installation files is the Enlightenment Web site at www.enlightenment.org. Here's where you'll find the latest version of *E* along with the requisite .rpm and .gz files. If you're more adventurous (and brave enough), you can download the pure source files and compile *E* yourself. We took the coward's approach using RPM files for their convenience and ease of use.



The Place To Be For E

If you're looking for a repository of all things E, then the only site you need to be visiting is the official Enlightenment Web site, found at: www.enlightenment.org.

There you'll find all the stuff you'll ever need to get totally enlightened about Enlightenment, from basic tutorials to some killer stuff. Enlightenment.org is also full of Enlightenment goodies.

If you haven't checked it out yet, you should. Do it today!

Installation Tips

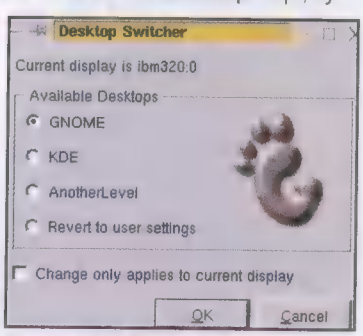
If you have GNOME installed, then you more than likely have an older version of *E* installed. To install the latest version, we first had to get rid of our old *E* files, version 0.15.5, and used the KDE Package Manager to uninstall the following packages:

enlightenment-0.15.5-12mdk.i586.rpm
enlightenment-conf-0.15-5mdk.i586.rpm

You could also achieve the same from a terminal prompt, by issuing the following commands as root:

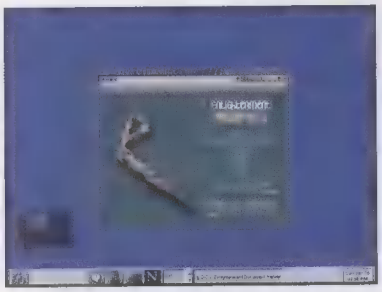
 # rpm -e enlightenment
 # rpm -e enlightenment-conf

Once you have successfully installed the Enlightenment packages and dependencies, you are ready to start *E*. If you're running KDE,



Running KDE? Use the desktop switcher to switch to GNOME.

and have GNOME installed then you can use the KDE Desktop Switcher to change the current desktop manager to GNOME. *Enlightenment* should launch along with GNOME and the default E-theme BlueSteel should appear.



This is the default E-theme, BlueSteel.

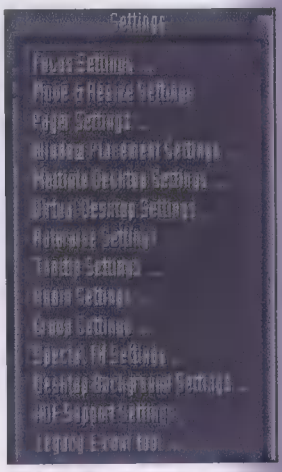
If you happen to have KDE and GNOME installed, but want to change your current desktop from within GNOME, use the Run Program menu item at the GNOME menu to access the **/usr/bin/switchdesk-kde** program. As you can see on the initial *E* desktop, the Help documentation window is up and the E Pager is on the bottom left corner. The Pager is a very nice graphical device that allows you to easily move around your virtual desktops. That said and done, let's move on to discover some of the features of *Enlightenment*.

Use Run Program from within GNOME to access the switchdesk-kde program.

Basic E Configuration

Using the mouse in E

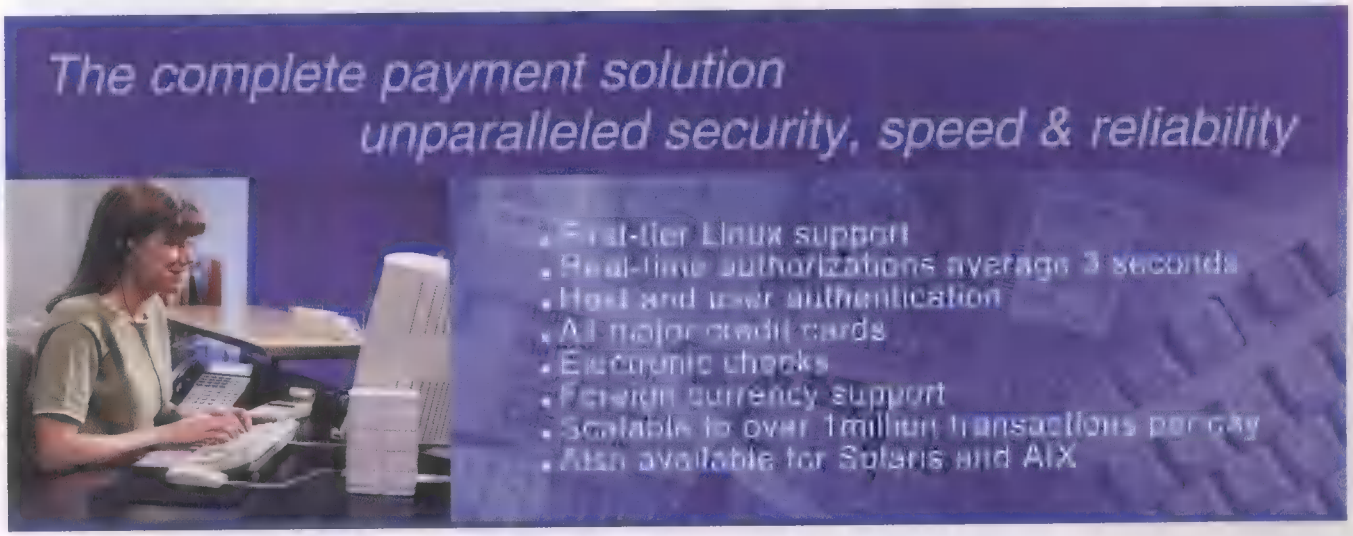
Getting around in *E* can be very graceful and exciting. However, it's very important to get the mouse buttons figured out before you begin your exploration. *E* relies heavily on mouse buttons; to be more precise, it expects a "three-button" mouse to work properly. What's that? You have a two-button mouse? Before you run out to your local computer store and plunk down some cash for the three-fingered variety, relax. You can emulate a third button by pressing both the left and right buttons simultaneously. Of course, this will only work if, during your Linux installation, you actually set your two-button mouse to emulate a three-button mouse. If you're a dunderhead and haven't, you can run the **mouseconfig** program to properly configure the beast and then restart your Linux box.



This is the Settings menu. 'Nuff said.

Accessing E Menus

If you click with your right mouse button anywhere in the background, the Settings menu shows up. If you use your middle mouse button (or press the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Desktop Environments

Several desktop environments are available for you, depending on your installation of Linux. The most common ones are KDE and GNOME. It's very important to notice that KDE has a built-in window manager, whereas GNOME is window manager independent. As a matter of fact, the default installation of GNOME uses Enlightenment as its window manager.

left and right buttons simultaneously, if you have a two-button mouse), then the *Enlightenment* menu should appear. Another menu, **Applications**, should appear if you click the background with you left mouse button. Try it. You'll like it. Mikey did. Don't panic if nothing shows up—you simply may need to regenerate your menus. If this is the case, just bring up the *Enlightenment* menu by clicking the background using the middle mouse button, then select **Maintenance**, then **Regenerate Menus**. A dialog window will show up, telling you that "Menus are being generated... please wait," which means that *E* is about to start the process of scanning your settings looking for installed applications. Click the **OK** button and in a few seconds another message will appear telling you the regeneration of menus is finished. Now, if you right-click anywhere on the background, you should see your applications menu.

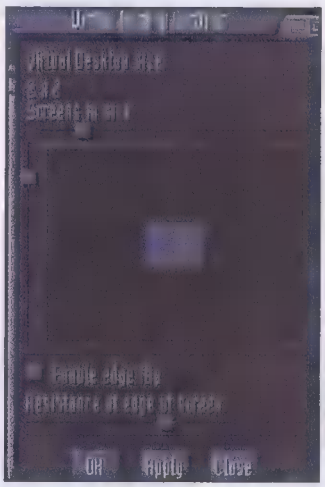
Take the blue pill. No, take the red pill. The blue pill. The red pill. Blue. Red. Aah!

what" in the *Enlightenment* world.

If you do not see any Tooltips, then the feature is more than likely disabled. To enable Tooltips and change the delay before they pop up, bring up the **Settings** menu by clicking anywhere on the background using your right mouse button. Then, select the menu option **Tooltip Settings**. You should see the corresponding dialog box; make sure that the option **Display Tooltips** is checked, then click the **Apply** and **Close** buttons. After that, if you hold the mouse pointer still over any window titlebar, for example, then you should see a Tooltip related to that graphical object .

Multiple and Virtual Desktops

E allows you to have multiple desktops, which is pretty cool. One of the menu options under **Settings** is **Multiple Desktop Settings....**



You can manipulate the size of your virtual desktops...

and you can have several virtual desktops running concurrently. Isn't *Enlightenment* cool?

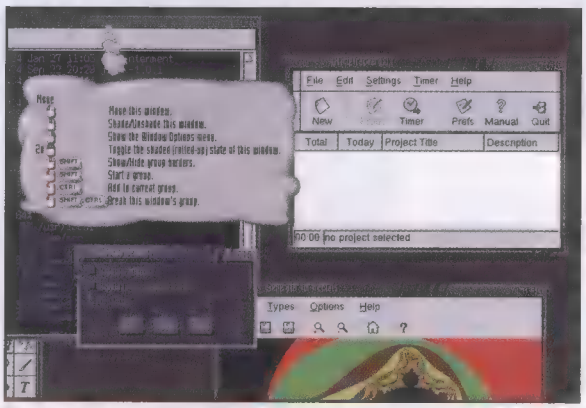
You can have several desktops running concurrently; to access them, use the Pager or the GNOME taskbar.

You can also manipulate the size of your virtual desktops. To do that, access the **Settings** menu, then **Virtual Desktop Settings....** As you can see in the dialog window, a desktop can be a multiple of your screen size (1x1, 2x1, 2x2, etc.) On the same window, you can also enable a very helpful feature of *E* called Edge Flip. Once enabled, you can easily scroll over to the next currently unviewable section of your desktop by sliding your mouse pointer in that direction.

Once again, you can use the Pager to access your virtual desktops.

Enabling Tooltips

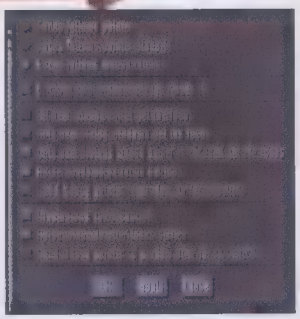
Tooltips can be an interesting and helpful way to get familiar with *E* functionality, menus, and how to access them using your mouse and/or keyboard. With Tooltips enabled, if you keep your mouse pointer still, a Tooltip message will pop up. Using this feature will allow you to easily know "what does



That isn't a cloud–it's a Tooltip!

Managing Windows

Now that you know how to access the *E* menus, let's explore some basic window configurations. First, you can always access the **Settings** menu to change the default window Scope out the **Focus** and **Move & Resize** settings. Under **Focus**, one of the more interesting selections is the "Sloppy Focus" feature, which means that any window will get focused as soon as the mouse pointer goes over it. In other words, you don't have to click on it, and, as an added bonus, if you move the mouse pointer over the background, the focus will remain in the last window you focused. Try it alongside different **Move & Resize** settings. To move a window around, just left-click on its titlebar, keep the mouse button down, and the window will follow your mouse movements. You can also move a window around by pressing the **Alt** key, then click and hold the right mouse button down on the window you wish to move.



Try out the "Sloppy Focus" feature. It's not what you think.

You can also move and resize your window settings.

Window Borders

Under *E*, you have complete control over the look and behavior of all windows. For instance, double-click on any window titlebar, and the window will automatically **Shade** or

If you choose a borderless style, don't panic! You can always access the Window Operation Options menu.

Red Hat Package Manager (RPM) is a pretty convenient way to distribute and upgrade applications for both Linux as well as other Unix operating systems, such as Solaris, FreeBSD, and AIX.

Using RPM, installation of very complex applications is very simple; all the daunting, messy details of compiling an application under Linux are cleaned up for you. Better yet, you can upgrade software, verify your system, and protect any customizations you've made to any application.

There are five basic operations you can perform easily using RPM:

Installing $ rpm -ivh this_app-1.0.1.i586.rpm

The above command will install the this_app-1.0.1.i586.rpm package, and display hash marks as the installation progresses. Messages will notify you if any conflicting packages are found or any unresolved dependency exists, in which case other packages must be uninstalled or installed prior to the installation of this_app-1.0.1.i586.rpm.

Uninstalling $ rpm -e this_app

This command will uninstall the package name this_app. Note: You do not need to specify the original rpm name, this_app-1.0.1.i586.rpm. Once again, if any packages that depend on this_app are found, you will be notified.

Upgrading $rpm -Uvh this_app-2.0.1.i586.rpm

RPM will automatically uninstall any old versions of the this_app package and install the new one. A backup copy of the old package configuration will be saved for you, in case you need to resolve differences, incompatibilities, or marriage infidelity between the two files.

Querying $ rpm -q this_app

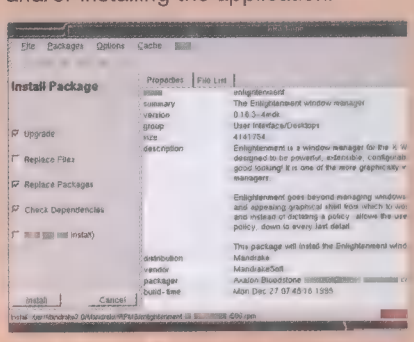
Using the -q option will display the package name, release number, and version of the installed package this_app.

Verifying $ rpm -V this_app

By using the above command, you can easily verify that all the files in the this_app package exist as they were originally intended, with no corruption present.

kpackage

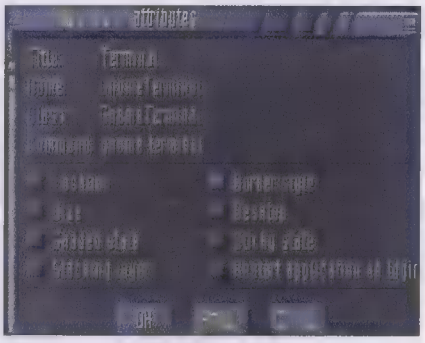
Under X you can run a program called kpackage to manage your system's installed packages. Also, when using any File Manager, if you click once on a PRM package file (noted with an .rpm extension), kpackage will launch a dialog window with information about the package and options for upgrading and/or installing the application.



For more information about the RPM technology and latest news, check out the RPM web site at www.rpm.org/.

Unshade. Right-click on the titlebar, and the Window Operation Options menu should appear. One of the interesting menu items is the **Stick/Unstick** option; a "sticky window" will remain "stuck to the glass" no matter what virtual desktop you select.

Another interesting feature is the **Remember...** menu option. If you click on it, a dialog box will appear, where you can set your window preferences for that particular application. The next time you run the same application, *E* will remember your window settings.



You can set individual window preferences for your favorite apps.

If you click on the **Set Border Style** menu option, a submenu will present the different window border options available for that particular E-theme. Try them out. If you choose a borderless style, don't panic–you can always access the **Window Operation Options** menu by pressing the **Alt** key as you right-click anywhere on the window.

Changing Desktop Backgrounds

To change desktop backgrounds, just access the **Settings** menu, then select the **Desktop Background Settings** dialog box. By default, you should see the background images provided by the current E-theme. To add your own backgrounds, just copy the images you want to use to your home directory,

Look closely and you'll notice Bob and Janice's house in the background. Next time you're in town, stop by and say hi!

into the **.enlightenment/backgrounds** subdirectory. Next, restart *Enlightenment* by accessing the *Enlightenment* menu (middle mouse button), then click on **Restart Enlightenment**. Now, if you bring up the **Desktop Background Settings** dialog box, you should see your own background pictures as thumbnails, ready to be selected.

Accessing Enlightenment Help Documentation

The standard RPM installation of *E* also provides help documentation with many additional tips and detailed explanations of many of the window manager features. To access those documents, just bring up the *Enlightenment* menu and click on the **Help** menu item. A window will appear, showing a browser-style document with hyperlinks to different subjects, from window management to special effects.

The help documents contain a lot of great information. Check 'em out.

Using E-Themes

One of the coolest features of *E* is the ability to change the look and feel of the entire graphical interface using Themes. Themes are a collection of configuration files, scripts, and images that define how windows and other graphical elements are shown on the screen.

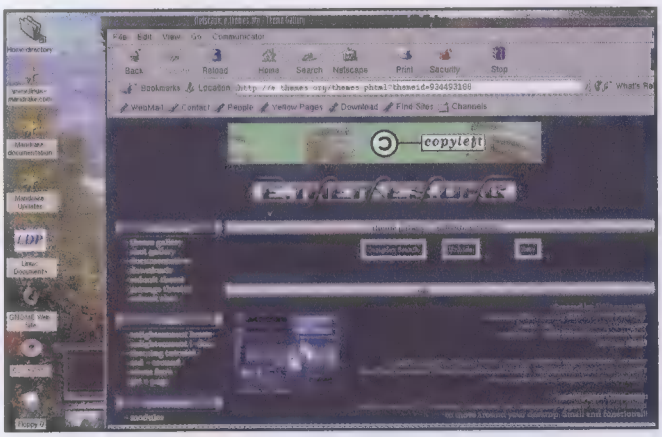
E-themes usually have a file extension .etheme, but they are nothing more than compressed files. We'll use the tar utility to uncompress the theme file and install it where E can make use of its scripts, images, and other resources.

E-Themes resources

The main repository of E-themes is at www.e-themes.org. At press time, there were almost 200 themes listed, with more than 600,000 downloads available, including Animals, Anime, Art, Cartoons, Computers, Fantasy, and many, many more. When downloading themes, be careful to pick those that match the version of *E* you are currently using, in our case DR16 (version 0.16.x); themes with the designation DR15 were originally made for version 0.15.x and may not work correctly under later revisions. One more tip: If you're brave enough, tutorials are available to help you create your own themes. If you've created your own, let us know! We'll start hosting them online at www.maximumlinux.com.

Downloading and installing an E-Theme

If you're installing *E* version 0.16.3, the default theme is BlueSteel. Let's follow our download and installation of one of the available E-themes. We found a very attractive one, called nlx.etheme, which we downloaded to our home directory. Then, we located our **/enlightenment/themes** directory, which happened to be in our /usr/share/ directory. The following steps were done as root:



We found this attractive E-theme, called nlx.etheme, and downloaded it directly from http://www.themes.org.

First, we located and changed our current directory to the E-themes directory:

```
# cd /usr/share/enlightenment/themes
```

Then, we made a directory using the theme's name:

```
# mkdir nlx
```

Next, we changed our current directory to the new one:

```
# cd nlx
```

The following step copied the tar'd E-theme file from our home directory to the new directory:

```
# mv /home/meuser/nlx.etheme ./
```

Finally, we uncompressed the E-theme file using the tar utility:

```
# tar -zxvf nlx.etheme
```

To use the theme, restart X and *E*. Then, using the middle mouse button, bring up the *Enlightenment* menu, click on **Themes**, and you should see "nlx" as one of the themes available. Click on that theme, and you should see the new E-theme on your desktop within a few seconds.

Even though *Enlightenment* is currently in development, it's still a grandiose project. The future of *E* looks brilliant and version 0.17 promises even more. For example, a file manager is already in progress, more advanced image libraries will be added, finer-grained control will be available on selecting graphical objects, and "virtual" resistance boxes and spacers in menus ... just a few of the upcoming features. As *E* matures and progresses, expect more graphical features and richer graphical user interaction. For additional information about the future of E, check out the main site at www.enlightenment.org, as well as www.themes.org.

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Window Managers

Window managers are the wind beneath the GUI's wings: filling in the gaps left unattended by the X server. From window decorations to launching applications, the window manager is the part of the system that allows users (that's you, Bub!) to highly customize the look and feel of their desktops. Regular Linux distros generally provide several window managers, such as *FVWM*, *fvwm95*, *rxvwm*, *olvwm*, and others. An in depth overview of window managers for X Windows is available online at www.plig.org/xwinman/, but for brevity's sake, we've included a short roundup for your tour today.

FVWM

http://www.fvwm.org/

This window manager is a variation of the *MWM* manager. It provides a well-defined 3D graphical look with a simple virtual desktop. By using different modules, some of its functionality can be enhanced.

FVWM95

ftp://mitac11.ulb.ac.be/html-test/fvwm95.html

FVWM95 is a close cousin of *FVWM*, but more stylish. When you see the way this window manager displays graphical objects on its desktop, you'll find some startling resemblance to a well-known operating system whose name also ends with 95. By using configuration files, you can modify the look and feel of the virtual desktop.

AfterStep

http://www.afterstep.org/

Based on the *FVWM* window manager, *AfterStep* attempts to emulate the *NeXTSTEP* user interface, with additional features and graphical objects. It provides *NeXTSTEP*-like features such as title bars, title buttons, window corners, and menu styles.

WindowMaker

http://www.windowmaker.org/

This window manager also tries to emulate the *NeXTSTEP* user interface, but uses a more defined and less busy approach. One of the interesting features is the color gradient effect on window presentation and "drag and drop" support, which do not exist in *AfterStep*.

Sawmill

http://www.dcs.warwick.ac.uk/~john/sw/sawmill

This is a very interesting and extensible window manager where the look and feel is controlled using the *Lisp* scripting language. Nevertheless, you can use some of its configuration files to obtain a certain degree of customization, without using the *Lisp* programming language.

VTWM

http://www.visi.com/~nawkeyd/vtwm.html

The *Virtual Tab Window Manager* was based on the original work of Tom LaStrange's *Tab Window Manager* (*TWM*). Like its predecessor, *VVTM* provides interesting features such as "click-to-type" and [illegible]. It's very easy to customize by using native and user defined macro functions.

wm2

http://www.all-day-breakfast.com/wm2/

This is a very simple and plain window manager with no customization available. Although you won't find fancy panels, buttons, or plugins, it is a very stylish window manager and has a distinctive, elegant feel.

OLVWM

http://www.phys.columbia.edu/~flame/olvwm.html

This window manager is the standard graphical interface for most of Sun's *OpenWindows* and very similar to *OLVWM*. It differs from *OLVWM* in the management of large virtual desktops, and supports many other features such as pixmaps and Gif images as icons.

SCWM

http://scwm.mit.edu/

SCWM stands for Scheme Constraints Window Manager. It's a very powerful window manager with its own scripting language, Guile Scheme. *OLVWM* allows a high degree of customization in different platforms and provides themes support.

CTWM

http://brugd.ctrl-c.liu.se/~dl/ctwm/

This window manager was based on the *TWM* manager. It provides 32 virtual desktops and allows windows to be assigned to different worksuaces. To allow easier navigation between desktops, a map is available to the user. Animation can also be enabled for buttons, icons, and backgrounds.

IceWM

http://icewm.sourceforge.net/

IceWM was created from scratch, not using any other existing window manager as the starting point. The result is a very fast- and efficient-window manager that performs very well in the GNOME environment.

MWM

http://www.lesstif.org/

This is a *Motif* window manager, part of the standard commercial release of *OSF Motif*. It allows customization via script files, under a regular X Windows server. A free clone version of this window manager, *lesstif*, is currently under development.

AmiWM

http://www.lysator.liu.se/~marcus/amiwm.html

This is the window manager for the "die-hard" Amiga user interface. Amiga's unique workbench is emulated to perfection and supports multiple screens. "Drag and Drop" features are included, and you can have different backgrounds in each virtual desktop.

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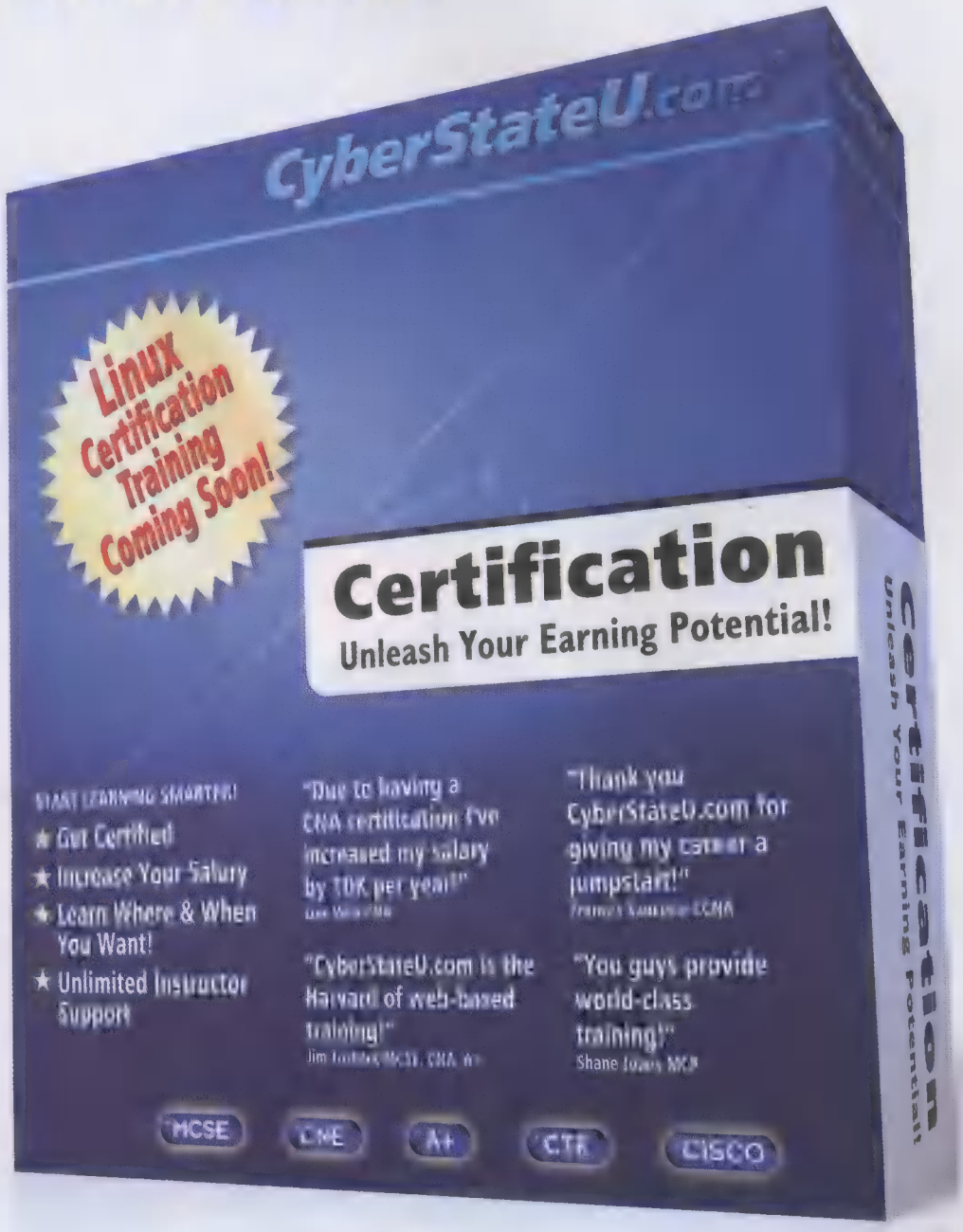

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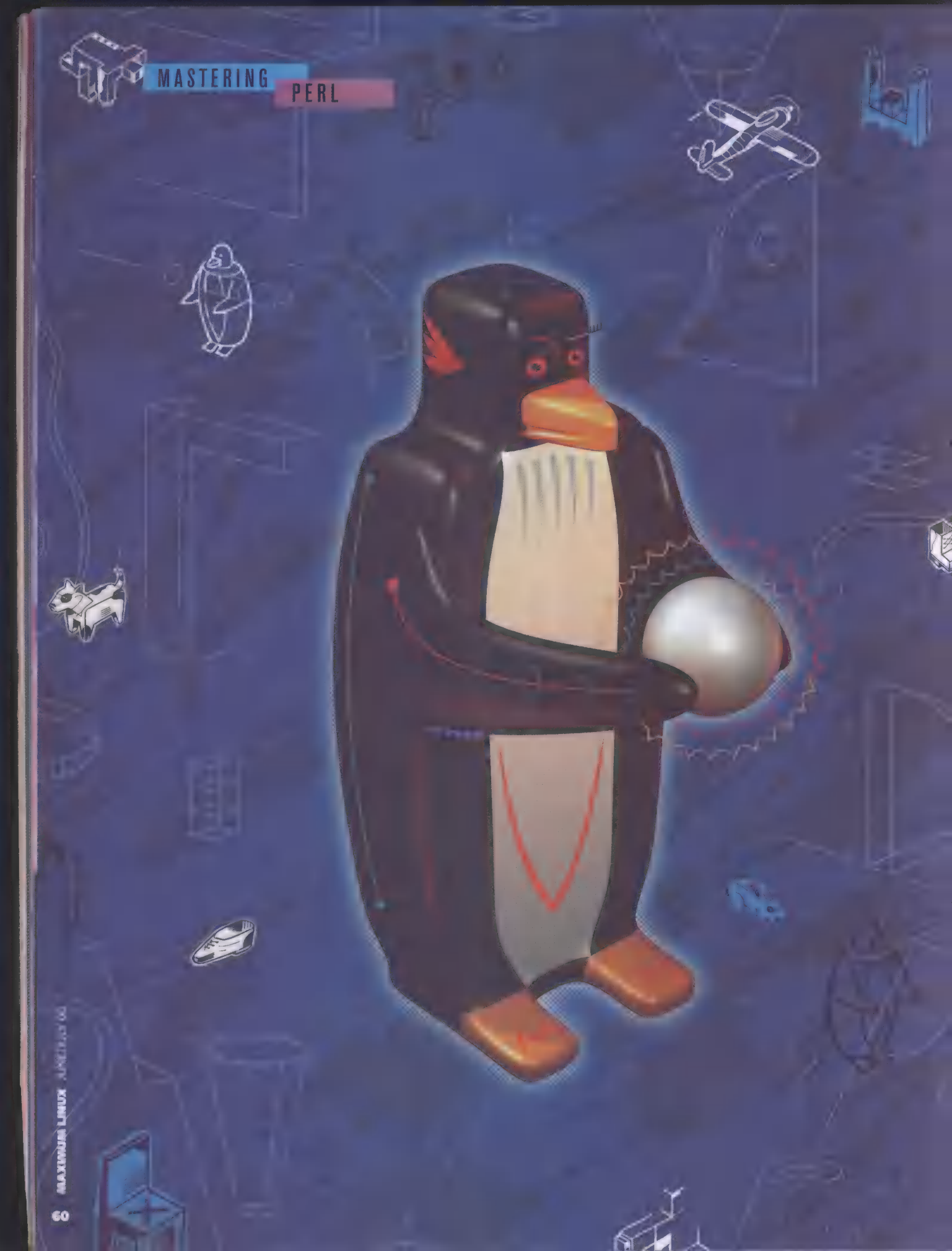


MASTERING PERL

PART ONE

Okay, everyone. Pay attention. A most intensive, and intensely interesting, class is about to begin.

Perl may stand for "practical extraction and report language," but trust us—it definitely is not as boring as that sounds! In fact, Perl has actually become the de facto standard glue language for UNIX. You might as well get used to saying, "Oh, that can be done with Perl," because that's usually the case! About its only downside is its speed or, more accurately, its lack thereof. Sure, working in Perl can be a tad slow, but for the overwhelming majority of tasks where Perl is used, it's more than fast enough. In short, it rocks!

Of course, the real problem is, "How does one get over the learning curve?" This, oddly enough, is both Perl's chief strength and its chief weakness. As you learn the Perl ropes, you'll soon discover that Perl is extremely concise and features many simple ways to do fairly complicated things. In other words, it's handy but cryptic. Stick with it, do your homework diligently, and you'll be as happy as the proverbial clam.

Our own resident Linux stud and this month's professor, Anders Brownworth, is back again for your reading pleasure, and he's going to take you through several example scripts to get you up to speed. Make sure you're sitting in front of your favorite Linux machine, and try each and every one of the examples he provides. You should familiarize yourself with the vast amounts of Perl documentation available online, too.

Now, let's get started!

"In love, anything is possible. For everything else, there is Perl"

by Anders Brownworth

Illustration by Steve Lyons

LESSON ONE: SAMPLE SCRIPTS

Perl is an interpreted language. This means that you make little text files and "execute" them by sending them through the Perl interpreter. Break out your favorite text editor (such as *emacs*) and create a file called "sample.pl" and enter the following program.

(Note: I usually use the extension ".pl" to denote Perl scripts, but you can use whatever you want.)

```
#!/usr/bin/perl

print "World domination, one line of perl at a time.\n";
```

Now make that file "executable" and run it by typing its name.

```
eyore:~> chmod +x sample.pl
eyore:~> sample.pl
World domination, one line of perl at a time.
eyore:~>
```

(Note: If execution fails with a "command not found," then your default path may not include the current directory. Execute the program like this: "./sample.pl" or check whether Perl lives in /usr/bin/perl or somewhere else.)

When you "run" this script, the shell takes notice that sample.pl is an executable text file, so it reads it to process the contents as if they were shell commands. All modern shells will notice that the file starts with "#!" so they give up trying to interpret it and launch the named program, sending the rest of the file to it as input. In our case, they launch /usr/bin/perl and send our script (all of one line) to it for execution. That's the first line of sample.pl.

The script is just a simple print statement that just does exactly what you would expect: It prints whatever you type between the quotes.

Don't forget: Perl statements end in a semicolon ";". Many times, syntax errors crop up because you didn't put a semicolon somewhere.

Don't forget: What is the "\n" all about? "back n" stands for the special character "newline," or the same thing as hitting the enter key.

Snigle: Line endings

The standard UNIX line ending is a "newline" character (\n), but DOS and Windows terminate lines with the two characters "newline linefeed" (\r\n). This really won't matter to you until you need to start reading Windows files with your Perl scripts.

Now, students, let's make it a little more interesting. Let's add a variable.

```
#!/usr/bin/perl

$name = "Anders";
print "Your name is $name?\n";
```

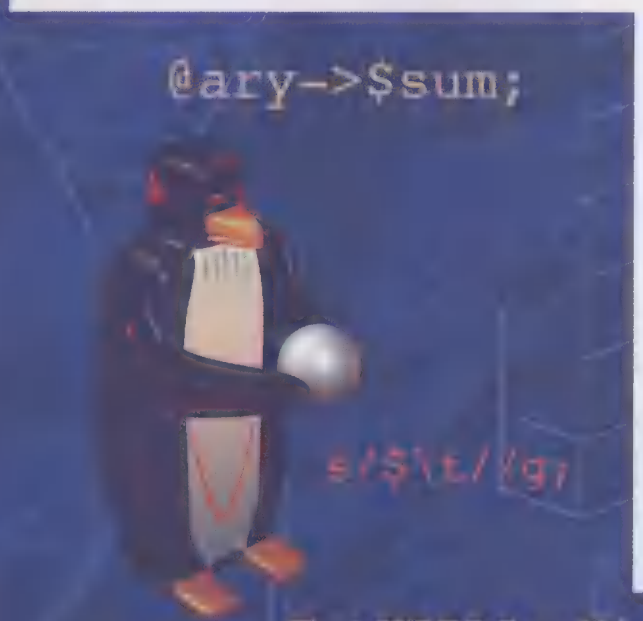
$name is a variable that we're using to store my name. We could also set this variable on the fly:

```
#!/usr/bin/perl
print "What's your name? ";

$name = <STDIN>;
chomp $name;
print "You wouldn't happen to be $name?, would you?\n";
```

(Note: Chomp is a little function that lops off the last character in a string if it is a newline or whitespace character. Notice the lack of a \n character in the first print statement. That's done because the user presses enter after entering their name.)

Or we could store a number in a variable:



```
#!/usr/bin/perl
for(;print"\e[2J";$d--){for$i(0..31){for(0..7){$_=1;$c=cos$d/($P=4*atan2(1,1));
$s=sin$d/$P;($_,2,4,8,16,32,64,128)[$_]&(63,127,63,1,65,1,65,1,65,1,65,1,65
,1,63,31,63,1,1,1,65,1,1,1,65,1,1,127,65,127)[$i]&&print"\e[",25+int$c*($Y=4+
int$i/4)-$s*($X=($i%4-2)*9+$_),"H",46+int$s*$Y+$c*$X,"H"}}select('','','',.1)}
```

```
#!/usr/bin/perl

$number = 5;
$square = $number * $number;
print "The square of $number is $square\n";
```

What about a loop?

```
#!/usr/bin/perl

$maximum = 10;
$number  = 1;
while ( $number <= $maximum ) {
  print "$number\n";
  $number++;
}
```

Here we are setting $maximum and $number and saying "while the number is less than or equal to the maximum, run everything between the { and the }." We increment $number with the perl-ism "++" or, in other words, add one to $number. The opposite of that would be "- - " meaning subtract one from the variable.

We can also construct arrays (lists) of items and pick things from them.

```
#!/usr/bin/perl

@days = ( "Sunday,"   "Monday,"
      "Tuesday,"  "Wednesday,"
      "Thursday," "Friday."
      "Saturday" );

$total_days = @days;
print "There are $total_days days in the week.\n";
print "The first day of the week is @days[0].\n";
print "The last day of the week is
@days[$total_days - 1].\n";

@time = localtime(time);
print "Today is @days[@time[6]].\n";
```

What's that, class? You're confused? Let me explain. A few things are happening here. First, we are making an array called @days with all the days of the week in it. We can call any particular day by referencing it by number, but arrays are numbered starting from 0, so @days[1] is "Monday."

@days is an array, but when we call it like a variable ($total_days = @days), it returns the total number of elements in that array. In this case, that would be 7. But don't forget that the last element of the array @days is 6, not 7, because the array is numbered from 0. So, in order to get the last element of the array, we call it like this: @days[$total_ days – 1].

Next, we are using a handy Perl function called localtime which returns an array representing the current date and time. It just so happens that array element 6 is the day of the week on a 0 – 6 scale, so we can convert that to the long form by calling the @time[6]'th element of the @days array: @days[@time[6]].

TIP: *The function localtime exposes a number of items which are covered in the manual page. In short, you can use them like this:*

```
($sec,$min,$hour,$mday,$mon,$year,$wday,$yday,$isdst) = localtime(time);
```

To read up on localtime and many other functions, type:

```
perldoc perlfunc
```

LESSON TWO: REGULAR EXPRESSIONS

One of the coolest things in Perl is regular expressions. Essentially, this is a very sophisticated way to search through a variable and find a match. While regular expressions may look cryptic, it doesn't take long to start understanding them. Check this out:

```
#!/usr/bin/perl

$line = "Love is blindness, I don't want to see";

print "blind is in the phrase\n" if ( $line =~ /blind/ );
print "love isn't in the phrase\n" unless ( $line =~ /love/ );
print "ignoring case, love is in the phrase\n" if ( $line =~ /love/i
);
```

You'll want to run the above example to understand exactly what is going on here. First, we establish a variable with a phrase in it. Next, we print "blind is in the phrase" only if $line contains the string "blind," which of course it does. But in the next line, "love" is not in the phrase because "love" and "Love" are different strings. Notice the use of "unless" which does the opposite of an "if" in this case. In the last line, we add case insensitivity to the match and, hence, get a match.

We can also selectively replace things in a variable:

```
#!/usr/bin/perl

$line = "Love is blindness, I don't want to see";

$line =~ s/want to/wanna/;
print "$line\n";
```

In this case, we are changing "want to" to "wanna." Preceding the regular expression with an "s" swaps the first instance of "want to" with what's on the other side of the replace, which is the word "wanna."

What would happen if we had another occurrence of the string "want to" in our sample? In that case, it wouldn't have been replaced unless we added a "g" to the end of the replace statement. For instance, the output of the following line:

```
$line =~ s/s/z/g;
```

which replaces all "s" characters with "z" characters, looks like this:

Love iz blindnezz, I don't want to zee

How about a more practical example? Let's say that you have a whole pile of MP3 files in a directory, and you want to get rid of the spaces in the names.

```
#!/usr/bin/perl

@files = qx {ls *.mp3};

foreach $original ( @files ) {
   chomp $original;
   $modified = $original;
   $modified =~ s/ /_/g;
   print "renaming '$original' to '$modified'\n";
   qx {mv '$original' '$modified'};
}
```

First, we create an array of all the files ending in .mp3 with the line @files = qx {ls *.mp3}; qx executes everything between the { and } marks as a system command and sends each line of the results to @files. Then we do a foreach loop through all the elements in @files. Let's say that the first element of the array is "love is blindness.mp3\n". In the first iteration of the loop, the string $original is set to "love is blindness.mp3\n" and then a chomp operation is done on the string, killing the \n. Then $modified is set to the contents of $original and has all its spaces replaced with underscores (s/ /_/g). Next, we print what we are going to do and then execute a move command with the qx line. Because we are inside a foreach loop, the process will repeat until all the MP3 files are renamed with underscores for spaces. Voila!

What happens if we have a bunch of illegal characters such as (and) in an mp3 name, and we want to convert those to underscores? With regular expressions come a whole slew of characters with special meanings. Here are a few:

```
\w    - Word character
\W    - Non-word character
\t    - Tab character
\d    - A digit (0-9)
\D    - A non-digit
```

So if we do this:

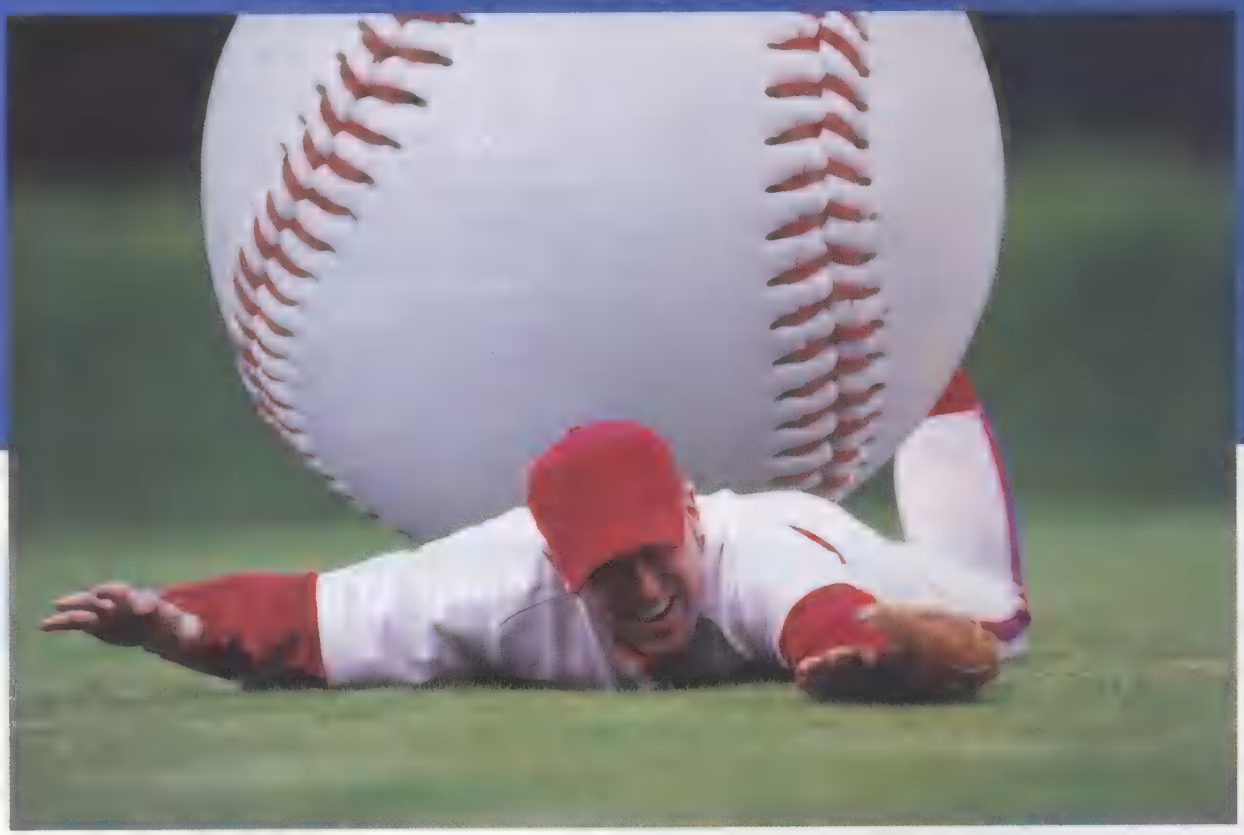
```
#!/usr/bin/perl

@files = qx {ls *.mp3};

foreach $original ( @files ) {
   chomp $original;
   $modified = $original;
   $modified =~ s/.mp3//;
   $modified =~ s/\W/_/g;
   print "renaming '$original' to '$modified.mp3'\n";
   qx {mv '$original' '$modified.mp3'};
}
```

Note that we use \W to select all non-word characters and replace them with an underscore. But the dot in ".mp3" is also considered a non-word character, so we lopped it off in the line above and added it back when we did the print and qx command. Obviously this little script could become as complicated as you want, adding numbers to filenames, and deleting multiple underscore marks. Another common use…

Can you handle the hits?



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Subroutines:

As soon as you start doing things more than once in any computer language, it's usually a good idea to create a subroutine to take care of these things. Let's say that you are reading numbers in and computing the square of each number. It would be handy to have a subroutine to take care of that, so consider the following example:

```
#!/usr/bin/perl

print "enter a list of numbers. (control-c to quit)\n";

while (<>) {
   chomp;
   $result = square ( $_ );
   print "the square of $_ is $result.\n";
}

sub square {
   my ( $number ) = @_;
   $number = $number * $number;
   return ( $number );
}
```

Whoa there! What happened to all the variable names? Well, in Perl there is a default variable (referred to as $_) that is implied wherever there would normally be a variable. Standard input from the keyboard is also implied when we do the while (<>) statement. In this case, what we are actually saying is something like this: while ($_ = <STDIN>) meaning that we are setting the default variable to whatever is typed in, one line at a time.

The next line sets the variable $result to be equal to the output of the subroutine square ( ). We are sending $_, or whatever the user typed in, to the subroutine square ( ) as a parameter. With luck, square ( ) will return the square of $_, so in the next line we print out the result.

The subroutine is defined at the bottom. In fact, it doesn't matter where you define a subroutine! Let's take a look at the first line in the subroutine "my ($number) = @_;". The special array variable @_ holds an array of the parameters that were sent to this subroutine. Because it is an array, we have to list our variables in an array form, which is why we have parentheses around $number. But, because we may have used the variable $number somewhere else in this script, we want to confine the scope of $number to just this subroutine, so we don't clobber whatever values may already have been in there (that's what the "my" does). Next, we compute the square of $number, and lastly we return the result. Now we have a routine, that we can call over and over with different values, that computes the square.

LESSON THREE: CGI APPLICATIONS

One of the coolest uses of Perl is for CGI Applications on Web sites. Typically, HTML is static. You write up the HTML file, you put it on your Web server, and people download it and look at it. Well, wouldn't it be nice if that little HTML file had some dynamic element to it, such as "today's date"? Well, never fear, we're going to do just that!

Because this is *Maximum Linux*, and just about every Linux machine in existence has the Apache Web Server on it, we're going to assume that you have Apache set up and executable files ending in ".cgi" are run as CGI programs. Consider the following code (although, this time, save it as "sample.cgi" and place it where you can get to it via the Web).

```
#!/usr/bin/perl

print "Content-type: text/html\n\n";

$time = localtime ( time );
print "Today: $time\n";
```

In this script, we print a legal CGI header (Content-type: text/html\n\n) and then call localtime (time) in a scalar context. (That is to say, we call localtime as if it were a variable.) Next we simply print the string "Today:"and then whatever localtime gave us. Some sample output of this program might look like this:

```
Content-type: text/html

Today: Fri Apr 28 02:26:37 2000
```

Notice the \n\n after the Content-type line. This is very important, as it signifies the end of the HTML header and the beginning of the content. When the Web browser renders this, it won't render Content-type…just Today: Fri Apr 28 02:26:37 2000.

Let's make a completely server-generated page that parses an HTML file and inserts the date wherever it sees ##date. If we have some HTML in a file called sample.inc that looks like this:

```
<html>
<title>Welcome: ##date</title>
<body>
 Today's date is ##date.
</body>
</html>
```

and we have the following script named sample.cgi:

```
#!/usr/bin/perl

print "Content-type: text/html\n\n";

$date = localtime ( time );

open (FILE, "sample.inc") or die "Can't open sample.inc\n";
while ( <FILE> ) {
 s/##date/$date/g;
 print;
}
close ( FILE );
```

Now when we hit sample.cgi in a Web browser, we should get the contents of the include file (sample.inc) printed out with every instance of ##date replaced with today's date. Of course, you don't want to do this on a heavily hit Web server, because pars-

ing every single line of HTML takes time, but it's still a great example.

So that's cool, but what about forms? Now that's where the real fun comes in! Consider the following code with the subroutine "parse." Form data shows up as if it were typed on the command line (STDIN) to a CGI application. This little routine will grab the data from STDIN and set it up in a nice handy format.

```
#!/usr/bin/perl

parse ( );

print "Content-type: text/html\n\n";
print "<html><body>\n";
print "Your name is $cgi{'name'}\n";
print "and your email is $cgi{'email'}\n";
print "</body></html>\n";

sub parse {
  read(STDIN, $buffer, $ENV{'CONTENT_LENGTH'});
  @pairs = split(/&/, $buffer);
  foreach $pair (@pairs)
  {
    ($name, $value) = split(/=/, $pair);
    $value =~ tr/+/ /;
    $value =~ s/%([a-fA-F0-9][a-fA-F0-9])/pack("C", hex($1))/eg;
    $cgi{$name} = $value;
  }
}
```

And we'll access this CGI program from a form that asks for some input:

```
<html>
<body>
<form method="post" action="sample.cgi">
Name: <input type="text" name="name"><br>
Email: <input type="text" name="email"><br>
<input type="submit" value="Go!">
</form>
</body>
</html>
```

Now, when the user hits the HTML page and enters some data, we will have access to it in the hash called $cgi{}. So to access what the person typed in for the name field, it is referenced as the variable $cgi{'name'}. The inner workings of the parse subroutine are a little beyond this Perl primer, but at least it gives you something with which to start hacking around.

Now that you have a good head start into the world of Perl, you will probably want to get yourself a book and start looking at some of the online resources that Perl has to offer. You really can do just about anything with Perl. It's been extended to deal with so many things that it would be hard to cover them all in one sitting! You can get Perl modules to do everything from read the id3 tag on an mp3 file to resize an image or connect to a database. The horizon is limitless, so don't be afraid to start hacking! Aside from its incredible flexibility, Perl is also quite a valuable tool to have on a resume, if you are so inclined. Take it from me, time with Perl is never wasted!

Class Dismissed

Okay, class. That's it for today. Please do your required reading in preparation for our next class, when we'll learn how to build an e-commerce shopping cart system with Perl!

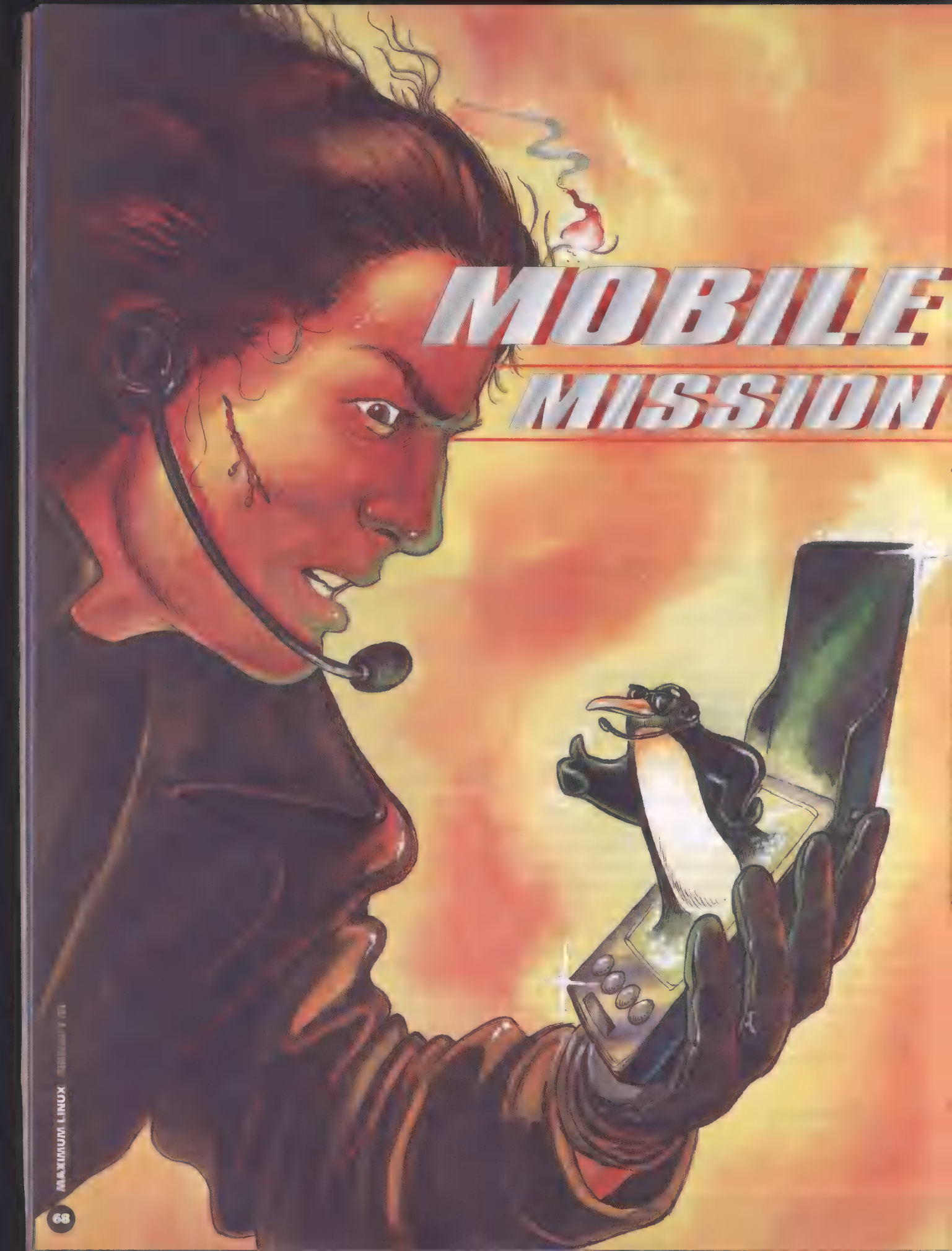
Required Reading

Without question, the best book I've ever had the pleasure of reading has been O'Reilly and Associates' *Programming Perl*. Not only is it a well-written and entertaining book, but it's littered with practical examples of how you might use something and why you would use it. All of this is done by example, which, as you probably know, is the best way to teach.

Programming Perl. is a hardcore Perl programming book. A softer introduction is O'Reilly's *Learning Perl*, which is actually the first real book on Perl that I ever read. If you acquire both books, however, you should have all the Perl resources you'll ever need.

CPAN, or the Comprehensive Perl Archive Network, is an invaluable source for Perl information, as well. They keep the official archive of Perl modules and are a great clearing house for everything Perl. You'll probably want to spend some time looking through the scripts and documentation. Check it out at www.cpan.org.

Another must-see Perl site is www.perl.org. Aside from the usual information, the site also houses very insightful articles about practical uses of Perl today, covering everything from the latest XML hacks to using a Perl script to virtually eliminate spam!


MOBILE
MISSION

IMPOSSIBLE-2

Listen up, Agents! In last month's installment of Mobile Mission Impossible, we provided the lowdown on the many solutions for palmtop computing. Now that you're suitably armed with the facts about the available hardware and software, our own intrepid agent, Scott Locklin, is back this month to show you how—and to what extent—you can hook up your favorite PDA to your Linux machine.

If you choose to accept this mission, you'll also discover the true identity of the PDA Locklin finally bought for himself, and what features he'd like to see the industry adopt to create what he deems a "truly useful computational device."

This magazine will self-destruct in five seconds. 5...4...3...2...1

by Scott Locklin

Illustration by Scott Peck

Talking to Linux with the PalmOS

When it comes to talking to Linux, PalmOS has Win CE beat quite soundly. Palm PDAs have become so ubiquitous these days that most Linux distributions ship with at least one utility that allows you to do just that. Here's a round-up of the most popular.

Thanks to Palm's great Open Source philosophies, there is a plethora of synchronization apps for Linux to choose from.

Pilot-link

http://www.redhat.com/swr/i386/pilot-link-0.9.1-3.i386.html

Pilot-link, a utility that ships with most Red Hat-based distros, allows command line connectivity with Linux, although you may have to do some minor configuration tweaks to inform Pilot-link which serial port your Palm PDA resides on. As usual, the Win95 COM1 and COM2 serial ports correspond to Linux /dev/ttyS0 and /dev/ttyS1. Once you've chosen to which serial port you'll connect your Palm Pilot sync cable, type:

```
ln /dev/ttyS0 (or /dev/ttyS1) /dev/pilot
```

At a shell prompt, check for the pilot synchronization tools by typing:

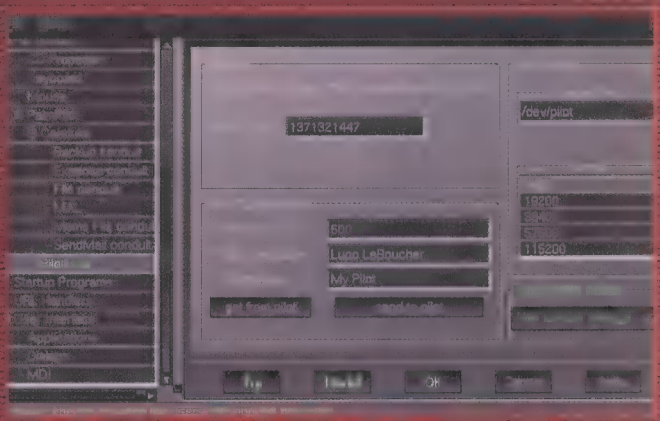
```
which /usr/bin/pilot-xfer
```

If the "which" command finds this file, you have Pilot-link in your Linux distribution. A successful start for your research! If not, you'll have to download the utility primarily to your particular distribution from the Web.

JPilot

jpilot.linuxbox.com/

Up one level of sophistication is JPilot, a utility that provides a useful graphical interface and basic synchronization features for the Palm PDA. It requires Pilot-link to use, as it's essentially just a graphical front end. For our own experiments with a Palm PDA, this was the ideal solution. It does everything you'll ever need: synchronization of calendar, phonebook, and to-do databases; backups; and file transfers.



JPilot may not yet be finished, but it's definitely

KPilot

http://www.slac.com/pilone/kpilot_home/mainpage.html

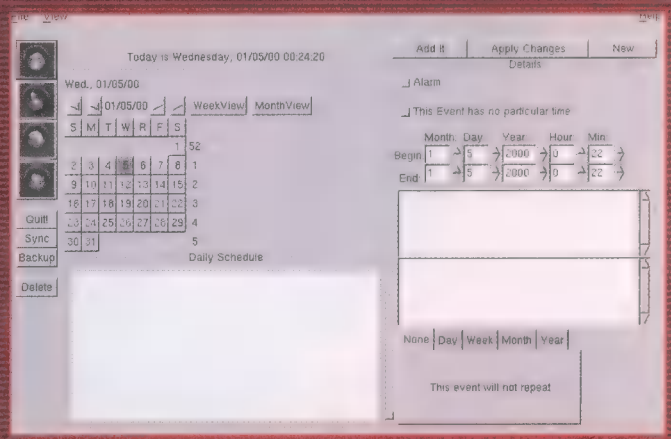
The KDE desktop synchronization software, KPilot, was also a no brainer once KDE was installed. If your Linux distribution doesn't come with the full KDE environment (Red Hat and Debian are GPL-only distributions, but KDE uses a non-GPL library), it will be difficult (but not impossible) to make this software work. KPilot has capabilities similar to JPilot, but its biggest advantage is that it can synchronize with a POP mailbox. You can perform POP synchronizations using the Pilot-link tools from the command prompt, too.

gpilot

http://www.gnome.org/gnome-pilot/

The GNOME group has an ambitious project in the works called gnome-pilot, or gPilot. It's still in early development, but is already quite usable. It integrates seamlessly with the GNOME control center and provides the most complete suite of synchronization features you'll find. It already has a front-end for Avant-Go-type "Web clipping" applications and allows for synchronizing with *Sunbird*. Like KPilot, gPilot is only useful if you have the complete GNOME desktop already installed.

KPilot is the desktop [illegible] still to use if you're [illegible] KDE.



JPilot, essentially a graphical front end for *Pilot-link*, does it all.

Potential Problems with Pilot Synchronization

Problem: I plugged the PDA into the correct serial port, but it doesn't do anything!

Solution: Hit the Pilot cradle sync button. Hit it again, but not too hard. For some reason, Palm hasn't figured out a way to make this automatic, and you have to press the cradle sync button to sync up.

Problem: This is taking forever!

Solution: If you already have a lot of data on your PalmOS device, first-time synchronization may take a long time, especially since the PDA communicates at only 9600 baud. Start it up in the evening before you go to bed, or while you're doing something entertaining, such as a nice game of Quake.

Problem: The first time I try it, my synchronization tool gives me error messages!

Solution: First-time synchronization may also cause problems if your PDA is brand new and has never been used with a Windows desktop. If this is the case, you may have to use the command-line tools from a shell prompt. JPilot (and some of the other apps) will step you through the process, but to do a backup from the command line, type:

```
pilot-xfer /dev/pilot -b /backupdirectory
```

Hit the pilot cradle sync button and install a user name and user ID number (this can be whatever you want; be a stud and use your UNIX id number returned when you type "id" in a shell window):

```
install-user /dev/pilot "Your Name" Your_ID_Number
```

Hit the pilot cradle sync button again. This time, it should work.

Problem: I left it in the cradle, and the battery died!

Solution: We found out about this one the hard way. Your humble again left his PDA in the cradle and ruined the battery. As it turns out, there is a pin in the cradle that does this if you leave the PDA in it for too long; this is a problem no matter what OS you use. We've been informed that you can short out a pin in the cradle to solve the problem yourself, with no ill effects—which leaves us wondering why Palm doesn't do this themselves. Consult your local PalmOS enthusiast Web site for details on the fix if you are handy with a soldering iron.

Problem: It doesn't like the file permissions.

Solution: By default, serial ports are only usable by root. This is a security feature. If you want to change ownership of the PDA serial port, type (while logged in as root):

```
chown your_username /dev/pilot
```

You can also type **chmod a+rw /dev/pilot**, though this is not recommended on a multi-user machine, as everyone will be able to access your personal PDA.

Talking to Linux with Windows CE

Windows CE has no such advanced synchronization tools available for Linux desktops at present. With a little hacking, one can still do backups, software installs, e-mail synchronization, and simple file transfers with a Linux machine, though you will need a Windows machine to do the initial setup, unless you're very, very clever.

This is all possible because Microsoft made the uncharacteristically wise choice to use open standards for their synchronization tools. The communications between desktop and handheld are done via PPP, and the e-mail client is POP3. Microsoft may also have used an open standard called Vcard for the WinCE PIM tools, as they did with Outlook Express. If this is indeed the case, full PIM synchronization of WinCE with GNOME or KDE desktops will eventually be fairly simple to implement.

Since the connection between the desktop and the WinCE machine is just PPP, all you need to do is fire up a new PPP connection on your Linux box. Using the common redial tool, and some ingenuity, you can simply create a new PPP network device. However, it is easier to explain how to write your own PPP dialer. First, figure out which serial port you will be hooking your machine up to. Again, /dev/ttyS0 corresponds to COM1 and /dev/ttyS1 corresponds to COM2. /dev/ttyS1 is generally a safer bet.

In the directory /etc/ppp/peers, create a file called wince which contains the following text:

```
/dev/ttyS1 115200 crtscts
connect '/usr/sbin/chat -v -f /etc/ppp/wince.chat'
noauth
nodetach
192.168.1.1:192.168.1.37
```

(Note: The last two numbers of the IP address can be whatever you want, but use the numbers above unless you don't mind to read the rest of this article.)

Now create a file in the directory /etc/ppp called wince.chat containing the following:

```
TIMEOUT 3600
"CLIENT" "CLIENTv"
""       "SERVER\c"
```

This is the chat script that gives the handshaking the WinCE machine expects. This is the key sound of the whole process. Everything else is relatively straightforward for your average UNIX network guru (which you'll turn into if you're crafty enough to make it to the end of this feature!).

For the sake of convenience, we can create a script in /usr/local/sbin which calls up your WinCE machine. Create the file /usr/local/sbin/callwince containing the following:

```
#!/bin/bash
/usr/sbin/pppd call wince
```

type, in a root shell:

```
chmod u+x /usr/local/sbin/callwince
```

Now you can give your WinCE machine an alphanumeric name instead of an IP address. Add a line to the file /etc/hosts which says:

```
192.168.1.37    wince
```

Your Linux box is ready to talk to a Windows CE device called "wince."

Now, on the Windows CE side, hit the start button (), select **Programs**, **Communication**, **Connections** (on Windows 9x/NT, **New** select **Connection** and **New**).

Other WinCE handheld devices, such as HP's newer Jornada, don't offer any easy Linux solutions.

Call your new connection **passive Linux**, and from now on a direct connection. Hit the **Next** button. Leave it as a serial cable on COM1. From select **Configure**. From here, select Port

Settings, and select the following settings:

115200 Baud
8 data bits
No Parity
1 stop bit
Hardware flow control
(leave all the rest of the settings on this screen unselected)

Now select **Call Options**.

Select **Cancel the call if not connected within** and put **5** in the box.

Hit **OK**.

Hit **TCP/IP Settings**.

Select the **General** tab then

Use server-assigned IP address

Use **Software Compression**.

Use **IP header compression**

Now select the **Name Server** tab and select **Use server-assigned IP addresses**.

Hit **OK** then **OK**.

You should have a new icon for connecting.

Still with us? Good! Type **/usr/local/sbin/callwince** on your Linux box. Hit the new passive Linux icon on your WinCE machine. Your WinCE machine should make a funny noise and be connected. If not, consult your documentation and happy hacking. Sometimes turning the Enable direct connections selection off in the connection settings (under the PC Connection tab) will solve conflicts.

Congratulations again! You've just made a PPP network connection between WinCE and your Linux box. Treat yourself to a beer. Smoke 'em if you got 'em.

Assuming you've gotten this far, you now need to make your network connection useful. I like to run an FTP server on my WinCE machine, so I can more easily service it from my desktop. Brehmah Itoh has done the WinCE community a great service by writing a freeware FTP server for WinCE, called *fpsvr*, which can be downloaded from: ww.wchito.com/wince/sh3_0_j.lzh. While *fpsvr* lacks many standard FTP server features, it works adequately to transfer files between your Linux and WinCE machines. There are also shareware and TFTP servers available. The big trick now is how to get the *fpsvr* install file onto the WinCE machine. The simplest way is to use, well, that OTHER operating system, and the synchronization tools that come with it, to get this file installed. Another idea I've pursued is to get POP3 e-mail synchronization between the Linux and WinCE machines and e-mail the *fpsvr* file to yourself on the WinCE machine. It's a great idea, which we lifted from Jim Chesson's FAQ at http://208.2.140.193/Master_CE/Default.htm (without having to spend mountain bucks or deal with rogue agents).

Once you get *fpsvr* on your WinCE machine and get it running, you can use your favorite FTP tools to transfer files or do backups of your WinCE machine.

If you want your connection to start automatically, you can append the following to the file */etc/inittab*:

Wce0:2345respawn:/usr/local/sbin/callwince

Now type the following at your root prompt to get Linux to reread the inittab file:

/sbin/init 2; sleep 5; /sbin/init 3

This will cause Linux to continue respawning the process "callwince" should anything interrupt it like removing your PDA from its cradle. If you've toggled "Enable direct connections" to on, a network connection can be made by plugging your WinCE machine into the cradle! Pretty slick. With the addition of a couple of scripts, you can set up your desktop to do incremental backups of your WinCE machine in the evenings. Since the WinCE e-mail client is simply POP3, you can also set up your machine to sync e-mail by setting up the desktop as a POP3 server.

Another basic function which needs to be addressed before completion of your mission is software installation on your WinCE machine. Generally they come in .exe or .zip files. Oftentimes the .exe is merely a self-extracting archive, which can be unzipped on Linux by simply typing unzip file.exe. Once you have successfully unzipped, you will find various files, some of which will have a suffix of .CAB or .cab. This is another compressed archive format, much like .zip. Most often something in the filename will tell you what platform the program in the CAB file is compiled to run on. For example, file wh3.CAB would be for sh3 platforms, like the Jornada, and file mips.CAB would be for mips platforms like the Vadem Clio or the Casio E-100.

If you copy these files onto your WinCE machine and double tap on them using an after market file browser, such as the CeQuickview program that ships with HP's Jornada, they will auto-install. For the poor slobs who, as I was stuck with what Microsoft gives you, you can put the CAB file into the WinCE directory \Windows\AppMgr\Install, and it should install automatically. (This is how the \Windows\WinCE synchronization tools work.)

Finally, to do a full "disaster" backup of the system installed on the Windows CE machine, use the backup utility which was shipped with it. Do the backup and transfer the file generated to your Linux desktop. While simply copying all the files from your CE system to your Linux box should do the same thing, there are likely to be all manner of software install problems in the event of a catastrophic failure or full hardware reboot of your CE machine. The built-in backup utility is likely to do a better job.

Potential Problems With WinCE Synchronization

Problem: What about permissions?

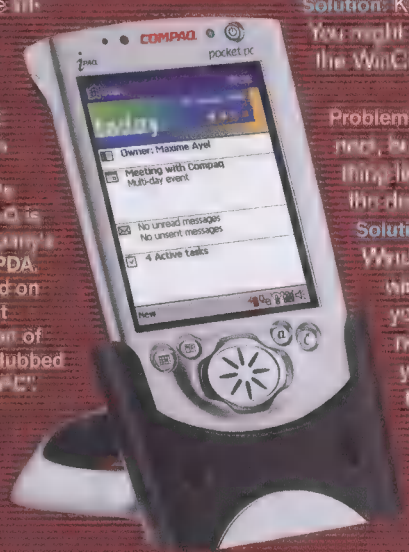
Solution: No surprise here. As with the Palm PDAs, you'll need to change permissions on the serial port and enable any user to start a PPP session. The latter is, again, a bad idea on a multiuser machine since anyone will be able to FTP into your WinCE machine while it's on the serial port. Even on a single-user machine, I would suggest sticking with "callwince" as root for security reasons.

Problem: It keeps trying to connect, but it never does.

Solution: Kill the callwince program and restart it. You might also try disabling "autoConnect" on the WinCE side.

Problem: The WinCE machine seems to connect, but it flashes a window that says something like "Cannot start communications with the desktop computer."

Solution: This means it is looking for a Windows machine at the other end of the wire to do windowsy things. As long as you don't acknowledge this screen, the network connection will work just fine. If you hit OK, the network connection will fail, and you'll have to restart it. If you disable auto-connect, this will not generally happen, but you'll have to start the network by hand on the WinCE side every time you want to connect.



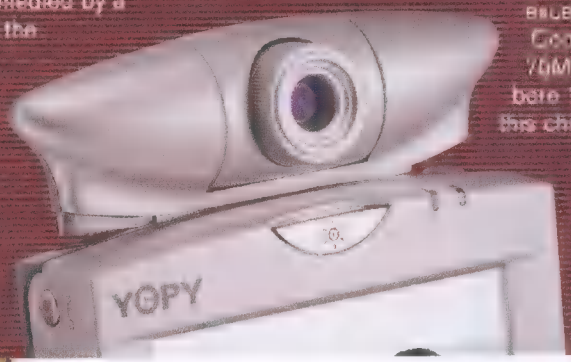
Compaq's iPAQ is the company's newest PDA. It's based on the latest reflection of WinCE, dubbed "Pocket PC."

What does the future hold?

The future, of course, is Linux. Or something like it. The short comings of WindowsCE– including proprietary development tools, sluggish and proprietary OS, lack of software, and poor PIM configuration–could all be remedied by a decent port of Linux. Considering the present worldwide interest in Linux, and the active developer community, it is only a matter of time before Linux begins to take over the hand-held world. There are ports of Linux to the Pilot PDAs, as well as all the important WinCE platforms, which are in "hello world" status, at least. There is even an excellent and efficient GUI

port, but good computational capabilities.

The present offerings show little sign of improving on their limitations. WinCE is forced to run on computationally intensive hardware, and it is still quite slow. Battery life will improve with semiconductor technology; the excellent battery performance of the Compaq Aero is an example. While its 70MHz MIPS CPU is slower than the bare 133MHz CPUs of the high end Casios, this chip is a computational giant compared to the Motorola DragonBall which run the PalmOS hardware. If history is any indication, Microsoft may eventually do better with the user interface. The newest version of WinCE, dubbed "Pocket PC" (it's still WinCE to me), apparently has new user interface code. On the other hand,



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If you copy these files onto your WinCE machine and double-tap on them using an aftermarket zip browser such as the I-Explorer

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The future, of course, is Linux. Or something like it. The shortcomings of WindowsCE – including proprietary development tools, sluggish and proprietary OS, lack of software and poor PIM configuration – could all be remedied by a decent port of Linux. Considering the present worldwide interest in Linux and the active developer community, it is only a matter of time before Linux begins to take over the hand-held world. There are ports of Linux to the Palm PDAs as well as all the important WinCE platforms, which are in "hello world" status, at least. There is even an excellent and efficient GUI developed which should allow the UI code from Windows and Windows CE programs to be recycled, as it is a rough copy of the win32 programming interface.

Transmeta may have some impact on Linux on PDA-type platforms, as a new keyboardless distribution of Linux (called "Mobile Linux") is part of the Crusoe strategy. So far no hardware manufacturer has come forward with details of a PDA-like device running Linux on a Crusoe chip. The closest thing we can tell you about so far will be the Linux-based WebPads (see Rants and Raves, page 95) which will be distributed by Diamond Multimedia later this year. However, with a size of approximately 8"x11", they are rather large for a PDA.

Another company, Gmate (http://www.gmate.co.kr/ is a subsidiary of Samsung) has a new Linux-based PDA dubbed YOPY, based on the impressive StrongARM chip due for release sometime this spring or summer. Even better, their development tools and source code should be available to the Linux community almost immediately. This machine is comparable to or better than the latest generation of WinCE machines in hardware configuration and will come with a set of tools like those available for most of the new WinCE machines: MP3 stereo, digital camera, color pc-card viewer, synchronization, etc. Samsung used to make the Philips Velo (before it was discontinued), which was generally considered to be one of the better WinCE offerings. But the great strength of Gmate's YOPY will lie in its Linux development tools and open source code.

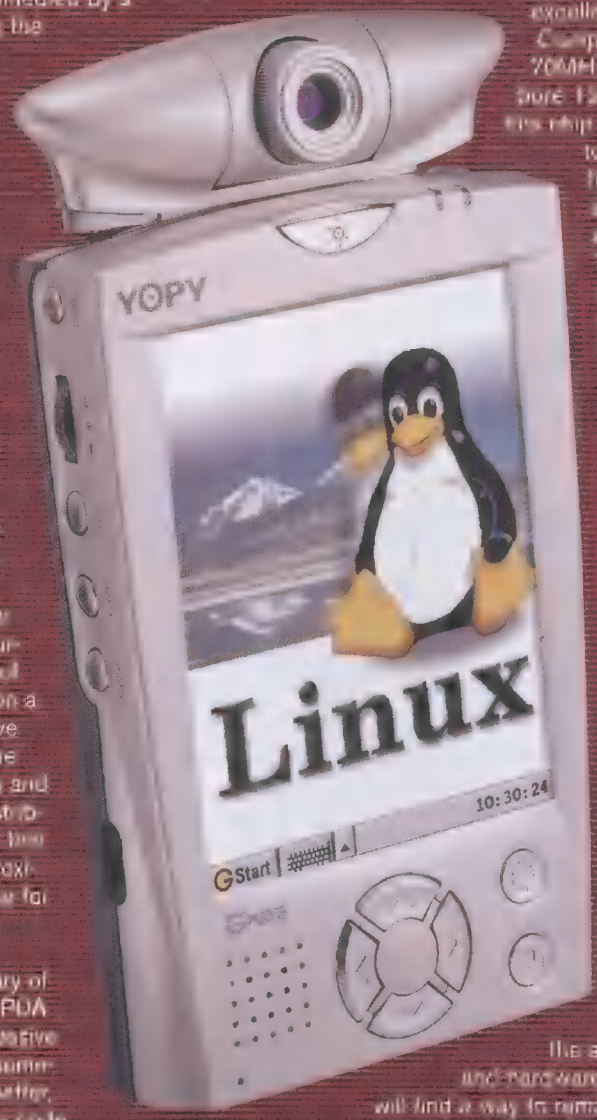
We all look forward to testing one.

Whatever your future missions may bring, at present the choice of a pocket computer for Linux users is an exercise in compromise. You must choose between machines with little computational capabilities but excellent PIM and software availability, and machines with lousy PIM and software support, but great computational capabilities.

The present offerings show little sign of improving on their limitations. WinCE is bound to run on computationally intensive hardware, and it is still quite slow. Battery life will improve with semiconductor technology: the excellent battery performance of the Compaq Aero is an example. While its 70MHz MIPS CPU is slower than the old bare 133MHz CPUs of the high-end Casios, this chip is a computational giant compared to the Motorola DragonBall which runs the PalmOS hardware. If history is any indication, Microsoft may eventually do better with the user interface. The newest version of WinCE, dubbed "Pocket PC" has a still WinUI to me) apparently has new user interface mode. On the other hand, as with the Windows desktop, it seems unlikely they will ever any better with the core operating system. Microsoft simply isn't very good at that sort of thing. There is some hope that Microsoft may eventually kill WinCE and go with an embedded version of WinNT.

PalmOS is an extraordinarily elegant piece of software. It performs the basic tasks wonderfully. The decision to lean toward an open-source philosophy has provided a wealth of useful small programs. However, unless it grows, it is ultimately doomed. Consumers will eventually want more powerful applications like MP3, color interface (and Photoshop-like multi-ups) for their digital cameras, voice recognition, and multimedia Web browsing.

Fiddling with and swapping out Springboard cards isn't likely to be the answer to a problem of limited OS and hardware capabilities. If they are clever, Palm will find a way to remain as happy as they have been, while adding a real operating system and more powerful hardware to their offerings. They seem to have an inkling of their weaknesses, considering the release of their Color PalmOS devices. These do not appear promising as they add no real functionality (they have the same small Palm screen size and more or less the same slow CPU) while sacrificing battery life. Color doesn't solve the fundamental problem of limited OS and hardware. I like to compare this to putting a Ford scoop and fancy racing stripes on an economy four-cylinder-equipped car. Ironically, the pundits who were loudly proclaiming the doom of PalmOS when WinCE first came out are now finally beginning to think that Palm may prevail after all. Based on our intelligence reports, we conclude that if they continue in the vein the PalmOS was doomed as Osbourne computer was. Unless the above mentioned changes take place, we'll more than likely witness its demise in the next couple of years.



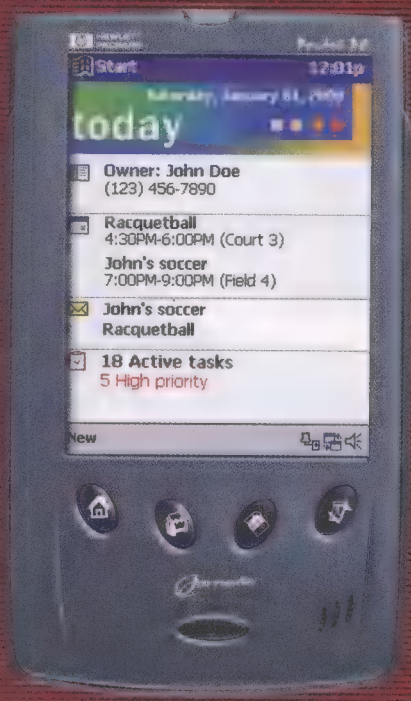
Samsung's YOPY is the first PDA that we know of that's been designed from the ground up using Linux.

Picking a PDA

For my Palmtop needs, PalmOS devices simply do not provide the functionality I require. They don't even approach my HP100LX in utility. So my choice was limited to WinCE machines. I figured I would be best off with a high end device with color and stereo MP3 capabilities. If only we it could do math calculations quickly. I went with HP's latest offering, the HP430 (already obsolete at press time). It has the best one-handed ergonomics and software suite of the high-end WinCE gizmos I tested. It was also the sturdiest looking. Concrete with a shield for the screen. I'm happy to report that it has survived a couple of falls onto concrete, and one onto a spinning rotary tool, with nothing more than a few scratches on the case. HP has certainly earned a reputation for rugged handheld devices considering their calculator and previous generation of pocket computers. Otherwise, HP's list of features is about the same as the other high end WinCE machines.

Am I satisfied with the machine? Hell, no! The thing periodically crashes and requires a hardware reset, losing work (and the state of applications, such as the page number of the e book I was last reading) in opened applications. It periodically slows down for no apparent reason. I get a sinking sensation every time I see the classic WinCE hourglass doing endless somersaults on my pocket computer. This happens often, and there is absolutely no excuse for it. If they can't manage to write an OS that doesn't crash (as Palm has), there should be a simple way to drop into a task switcher which will allow the user to kill rogue processes, at the very least. While HP made the best of a bad thing by adding on a set of programs to make up for the user interface shortcomings of WinCE, the user interface still leaves much to be desired. Microsoft needs to start thinking of "users" – not "consumers." Available software is, as I mentioned last time, limited. Writing your own software requires you to spend about $1,000 on a development suite using the WinCE SDK combined with the tcp and VC++ compiler, running on WinNT, which I despise. It's also damned ugly to write code for. The only thing it really has in common with Win98 is how often it crashes. Another problem, the only one unrelated to the OS, was the color screen. It doesn't work well in bright daylight. However, since most of my missions are done in the stealth of night, the availability of color for graphs and photographs outweighed this problem.

It did meet my specifications, and, with some difficulty, it runs the type of software I needed to run (number-crunching stuff). It also does more than I expected. The ability to use various sound bites for alarms, for example, is actually very useful for classifying alarms, not to mention a lot more attention-getting than the one-bit beeps of PalmOS devices or my HP100. High resolution color backed up by a beefy CPU is tremendously useful for things I hadn't imagined like carrying a digital photo album, CAD, grabbing color maps, etc. But I often miss my old HP100 for its sheer utility.



HP's new Jornada 540 PDA dumps WinCE 3.11 for Microsoft's new "Pocket PC" OS instead. Oh joy...

If Scott Ruled The World...

Working within today's hardware limitations, companies could do a hell of a lot better than they have. Here are five points of palm computing world domination:

1) The present hardware is sufficiently powerful. There is no need to go much beyond 200MIPS for any palmtop application I can think of, even for fancy games. As I said in my last briefing, this is the processor power of the last generation of UNIX servers. The top end WinCE machines already have impressive screen resolutions (320x240 and 64,000 colors) and sound capabilities. Yes, V.gorilla, multimedia in the palm of your hand is a tremendously good thing. They can do better with power management, and tiny light screen readability for color machines. More hardware "cleverness" such as fold-away key boards, radio/TV tuners, integrated cellphones, or modems would be nice, too, but it seems that the hardware manufacturers are unwilling to take a risk on this, perpetually stuck fighting what Palm did years ago.

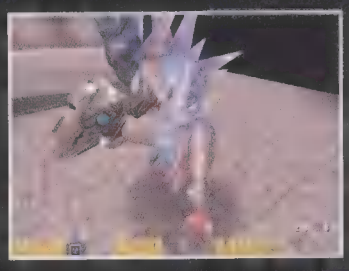
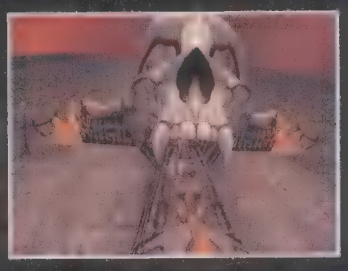
2) The operating system should never crash. Crash-free, 24/7 computer operation is 1970s technology. It's used daily to run Internet servers, network routers, telecommunications nuclear power plants, Palm Pilots, and medical technology. There is no excuse for crashes in the 21st century. If there are any failure modes (failure modes of the UI or individual programs are more understandable), hitting the reset button should drop you into some kind of task manager that will allow you to save your work, and kill only trouble some applications.

3) The UI should be intuitive and configurable. Any yoyo-boss, fry cook, magazine editor, or U.S. Congressman should be able to pick it up and use it immediately. But those blessed with an active cerebral cortex should have the ability to customize it, as well. PalmOS is fairly intuitive (Graffiti), but not at all configurable out of the box (hackmaster helps). WinCE is neither intuitive nor configurable. Installing new software and data should be as mindless as using it, and time should be kept already available. The fry-cook should be able to put Doom on his PDA with ease. Data for the Congressmen tracking his campaign donations, or the soap baron tracking his sports scores to his database software. This needs to be improved. Most people just use their PDAs as expensive alarms and address books, and there is no real reason for this other than ease of use.

4) There must be a built-in scripting language and "shell." There are far too useful, and easy to add, to do without. For example, if I am supposed to call someone at a certain time I want the "call someone" alarm to sound, and their telephone number to show up on the screen. If I am supposed to be somewhere I want the "get driving" alarm to go off, and directions on the screen by the time I acknowledge the alarm. I want links in address books to lead to the maps or pictures or Web pages. My HP100LX did this sort of thing years ago with macros and batch files.

5) The OS development tools should be free, and they should be carpet-bombed everywhere from Bratislava to Bromp. Software developers and the useful code they write are what make or break a platform. The more the merrier. Strangulating your developer base of small coding houses and individual hackers (i.e., the people who write most small applications) by charging a couple hundred dollars for your compiler is self-defeating.

QUAKE III ARENA

Quake III: Arena is the third (and possibly last) progeny in the series of first-person shooters that started the whole Internet gaming phenomenon we know today. Over the next five pages, we'll tell you how Quake III: Arena stacks up against the competition and help you get the most out of the game with regard to server browsing, end-user modifications, and running your own server.

by Michael Luton

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Setting Up a Server	80-81

WHAT VIDEO CARD SHOULD I BUY?

We can't really tell you what video card is going to be best for you, since every user has different needs, but we can give you a little bit of advice with regard to *Quake III: Arena*. 3dfx cards have always been an excellent choice for gaming under Linux. Plus, if you want to stay compatible with Glide-only games such as *Myth II* and *Unreal Tournament*, then this is really your only choice. While Voodoo2 cards will run *Quake III: Arena* just fine, we strongly recommend Voodoo3 or higher. We noticed a lot of visual anomalies—including corrupted textures and weapon effects with our dual Voodoo2 setup—but the Voodoo3 3000 performed perfectly.

If you're not worried about Glide-only games, then you might want to check into Matrox's G200 or G400 cards. These have the advantage of 32-bit color rendering and the

➡P.77

REQUIRED

3D accelerator with full OpenGL support; Pentium II 266MHz; 64MB RAM (128MB recommended); 480MB hard disk space (for full install); Linux kernel 2.2.9; Glibc 2.0; Xfree86 3.3.5; OSS compatible sound card; TCP/IP | LAN

HIGHS

- Great level design
- Rich atmosphere
- Diverse characters

LOWS

- Deathmatch only
- Not enough maps
- Weak AI

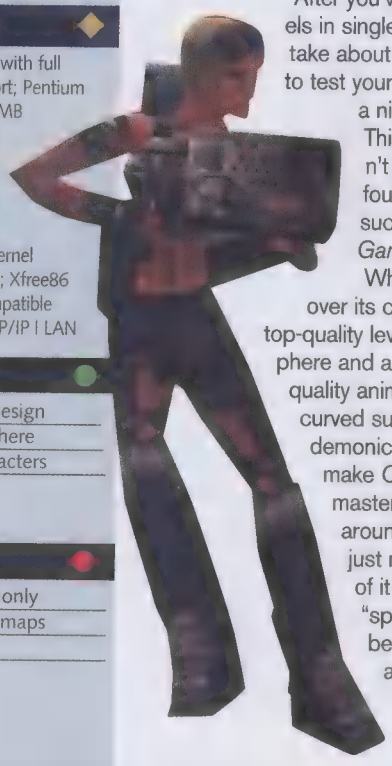
Quake III: Arena

A FRAGFEST DELIGHT

The 1-on-1 tournament level is enshrouded in fog. You'll have to use sound clues to win this one.

Let's dispense with the traditional introduction and get right to the heart of the matter. *Quake III: Arena* is a kick-ass multiplayer deathmatch game. Nothing more and nothing less. Don't expect deep teamplay functionality. Don't expect new and innovative game modes. It's all about pure, unadulterated deathmatching. If that's not your cup of Joe, then you might want to try an alternative beverage, perhaps *Soldier of Fortune* or *Heavy Gear II*, but if you're like us and were raised on *Quake* deathmatch, then *Quake III: Arena* is going to occupy a lot of your time.

Yea, we know there's a single-player mode where you can play through all the levels against computer-controlled opponents. But id Software isn't exactly known for its prowess in the AI department, and *Quake III: Arena* doesn't do much to change that perception. While the AI is light years ahead of *Quake II*, *Quake III: Arena's* AI still doesn't compare to the amazingly human-like behavior found in *Unreal Tournament*.



After you've blown through all the levels in single-player mode—which will take about three hours—you'll be ready to test your skills online with the help of a nifty built-in server browser. This is a nice feature but doesn't approach the functionality found in third-party applications such as *XQF* (Linux's version of *GameSpy*).

What *Quake III: Arena* has over its competition is consistent, top-quality levels that just drip with atmosphere and a sense of foreboding. High-quality animated textures, subtle use of curved surfaces, and wonderfully demonic architecture all contribute to make *Quake III: Arena* a true visual masterpiece. Heck, we wandered around the levels by ourselves just marveling at the dark beauty of it all. Although, the last set of "space" levels left something to be desired; we want to run around and shoot things, not hop around on jump pads like we're in some cheap *Mario* rip-off. Also, it would've been nice to have seen the classic *Quake* and *Quake II* deathmatch maps remade in *Quake III: Arena*. We have many of the characters from id's past games, so why not redo some maps as well?

The weapons in *Quake III: Arena* are pretty much standard fare for a first-person shooter. It would've been nice to see id branch out and try out some new concepts in this department, but instead we get a "best of" collection from past games. The Plasma Gun is our personal favorite for its combination rapid-fire high-damage projectiles with minimal splash damage. As far as sound effects go, nothing can top the teeth-rattling boom of the Shotgun. The Grenade Launcher is once again a throwaway weapon that we find ourselves using only when we're out of ammo for everything else. The Lightning Gun makes its triumphant return from the original *Quake* but lacks the underwater discharge effect that made the original so interesting in the first place.

But what *Quake III: Arena* lacks in weapons, it more than makes up for it in it's variety of characters. There's a total of thirty-two unique characters with some of the highest quality skins you'll see in any game out there today, thanks to id Software's incredible skin-artist Kenneth Scott.

When all is said and done, *Quake III: Arena* is a first-rate deathmatch experience that nobody should miss. While *Unreal Tournament* is easily one of the best first-person shooters out there, *Quake III: Arena* is a pretty damn good game too. A lot of people are going to have fun with this one. Don't be left in the cold—play with us today.

MAXIMUM LINUX VERDICT

Price $50

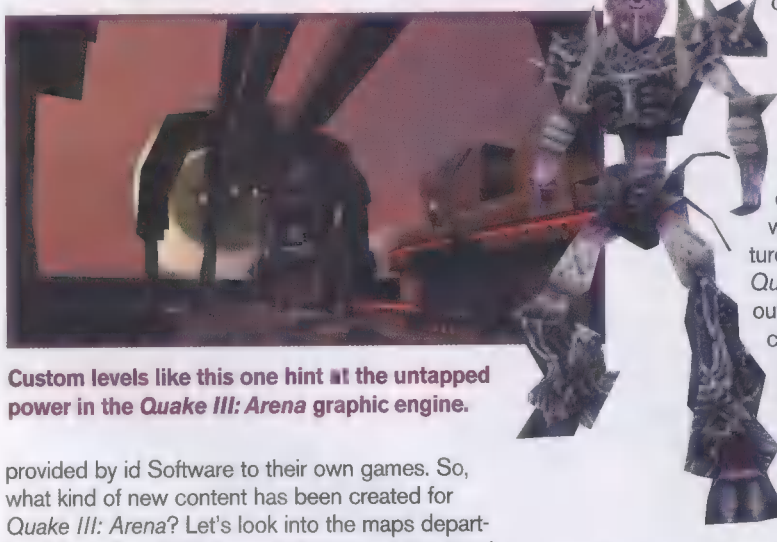
Company id Software/Loki Entertainment

URL quake3.lokigames.com

8

MAPS, MODELS, AND MODS

The *Quake* series wouldn't be nearly as popular as it is today without enabling end-users to add their own content and even reprogram the rules of the game. The changes can be as simple as a new skin for one of the characters or a whole new game with entirely new content. The concept of the garage game programmer has been reinvented as groups of individuals adapt the tools provided by id Software to their own games. So, what kind of new content has been created for *Quake III: Arena*? Let's look into the maps department first. *Quake III: Arena's* thirty maps are good, but we always want more. There are a lot of top-quality maps out there ripe for the downloading. The best source online for custom-made maps is **www.planetquake.com/lvl**, many of which rival those directly from id. Some authors aren't concerned whether their levels run fast on lower-end computers, so they've really put *Quake III: Arena's* new technology to work and have produced some levels with some amazing visuals that will push your computer to the limit. Just make sure you have a fast CPU and lots of memory.



Custom levels like this one hint at the untapped power in the *Quake III: Arena* graphic engine.

Installing and playing custom levels is pretty straightforward. Download the **.zip** file and extract the contents with unzip. For example, if you downloaded lloydmdm1.zip you would type **unzip lloydmdm1.zip**. This should leave you with a .pk3 file and maybe a .txt file if the author decided to include one. Now copy the .pk3 file to your baseq3 directory with **mv lloydmdm1.pk3 /usr/local/games/quake3/baseq3**. If you installed *Quake III: Arena* to a different directory, then modify the path as appropriate. Now, start up the game and bring down the console by pressing the tilde ~ key. Type **map lloydmdm1** (or whatever map name it was you downloaded) into the console, and it should load up with bots and all.

Wouldn't it be nice to see some new faces to go with those new levels? *Quake III: Arena* comes stocked with a great variety of characters, but a great place to find new faces is at **www.planetquake.com/ploycount**. Installing custom models works exactly like levels. Extract the contents of the .zip file and copy the .pk3 file to your baseq3 directory. Start up the game, and the new characters should be included in the menus.

Maps and models are all well and good, but what if what you're really craving is something other than plain old deathmatch? This is where the more full-featured mods come into play. *Quake III: Arena* has been out long enough now that a couple of really good mods have hit the scene. They may still be a little rough around the edges, but the groundwork for some quality work has definitely been laid.

Q3F, a mod in the spirit of the original Team Fortress for the original Quake, is in beta and already has several custom maps, weapons, and player classes. You can learn more about it and grab the beta version at **www.q3fortress.com**. *Jailbreak* for *Quake III: Arena* has also hit the streets. This was an amazingly popular *Quake II* mod and looks absolutely stunning in the *Quake III: Arena* engine. You can learn more about this one and get your copy from **q3jb.teamreaction.com**.

To install a mod, download the .zip file and extract its contents with unzip. Now create a directory parallel to baseq3 for the mod. For *Jailbreak* you might want to call this directory "jailbreak." Copy everything from the .zip file (which is usually just a .pk3 file) into this directory. When starting up *Quake III: Arena*, use an extra command line parameter to make it load the new code. Using *Jailbreak* as an example again, we would start the game by typing **quake3 +set fs_game jailbreak**, where jailbreak is the same name as the directory you copied the .pk3 file to. Visit the respective mod Web sites to learn what servers are running them. Use the **Specify** button in the Multiplayer menu to connect to a server.

Whew! If you visit the Web sites mentioned in this article, you should be able to learn anything you need to know about *Quake III: Arena*. Enjoy!

VIDEO CARD...

← P.76

fact that John Carmack (id Software's programming guru) is on the development team working on the drivers. In short, you can be darn sure *Quake III: Arena* is going to look its best on this card.

ATI's Rage Pro has been proven to run *Quake III: Arena* acceptably at lower resolutions. However, it's an older card with only 8MB of RAM. While it'll work, I recommend upgrading to a better card in the near future. If you haven't played *Quake III: Arena* in 1024x768 resolution, you don't know what you're missing!

One chipset that's very popular in the Windows world is nVidia's TNT/GeForce line. However, it's hard to recommend nVidia-based cards for your Linux gaming needs right now because the performance with the current drivers is below par. Looking into the future, the company is planning to bypass XFree86 4.x DRI architecture for its own proprietary solution which will most-likely not be Open Source. We'll have to see how things shake out in the coming months. The potential for nVidia hardware is amazing and we'd love to see some high-quality standards-based drivers take full advantage of it. We'll definitely keep on top of this situation, and let you know when things firm up.

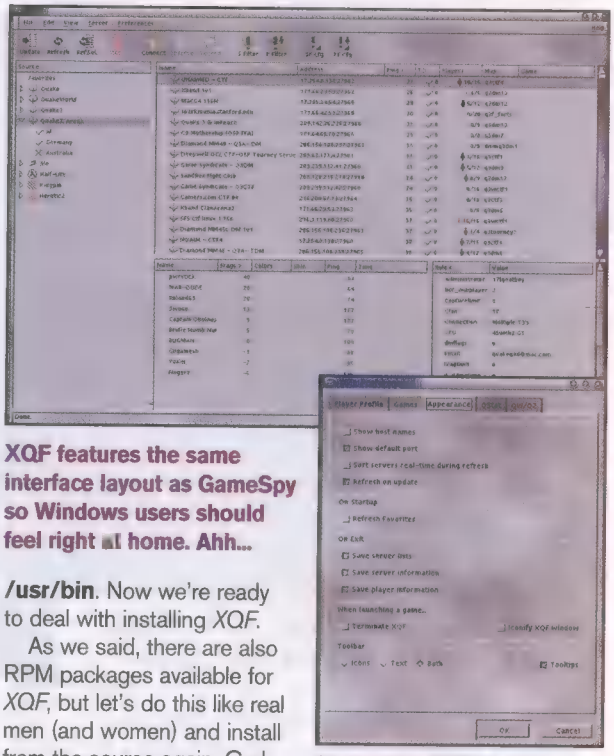
SERVERS OF THE WORLD UNITE

After you've beaten the single-player mode of *Quake III: Arena* into submission, it's time to go online to test your skills against real human competition. So how do you go about finding where the good games are? Well, you could use the server browser built into *Quake III: Arena*, but it has a few flaws which may be annoying for newbies and experienced players alike. Currently, there are anywhere from 2000 to 3000 servers running at any given time. It can take quite a long time to ping all those servers, and if you exit one game to join another, *Quake III: Arena* will wipe your list clean and start pinging those servers all over again. You also won't get more detailed information–such as who's playing on a server; what is everyone's ping; or what special rules are in effect. Windows users have had the joy of using *GameSpy* for several years now for all of their server browsing needs. But, unfortunately for us, *GameSpy* is a Win32 application and doesn't run on Linux. We're in luck, though, because there are a couple of programs out there that combine to make a solution almost as good as *GameSpy*. *QStat* and *XQF* to the rescue.

QStat is a command line program that queries game servers and returns information about them. You may have seen Web-based server listings like those at **gameaholic.com/servers**. These kinds of Web pages use *QStat* to generate most of their statistics. *QStat* is also the brains behind *XQF*, which is basically a graphical front-end for *QStat*. You may never need to use *QStat* directly, but you will at least need to have it installed on your system. There are RPMs available, but just for kicks let's install it from the source!

INSTALLING QSTAT

First off, download the latest version of the source code from **www.activesw/people/steve/qstat.html**. At press time, the latest version is 2.3g. Extract the contents by typing **tar xvfz qstat23g.tar.gz** at the command shell. Read **compile.txt** before doing anything else, since there's important system-specific information in there. If you have a fairly normal setup, then you should only have to type **make linux** to compile the source code. Some strange-looking text will scroll up, and you'll eventually end up back at the command prompt with a fresh qstat executable waiting for you in the same directory. Copy this file to a more general-purpose directory where it will be in the path for all users on your system. We chose to put it in **/usr/bin**. Now we're ready to deal with installing *XQF*.



XQF features the same interface layout as GameSpy so Windows users should feel right at home. Ahh...

As we said, there are also RPM packages available for *XQF*, but let's do this like real men (and women) and install from the source again. Grab the latest version from **www.linuxquake.com/xqf**, which in this case happens to be 0.9.4. Extract the contents like we did before with **tar xvfz xqf-0.9.4.tar**. The steps for compiling and installing *XQF* follow that of many larger, high-quality software packages. Find a command shell and execute the following three commands:

Customize XQF to your liking. Try turning off "Show host name" to speed up refreshes a bit.

```
./configure
make
make install (while logged in as root)
```

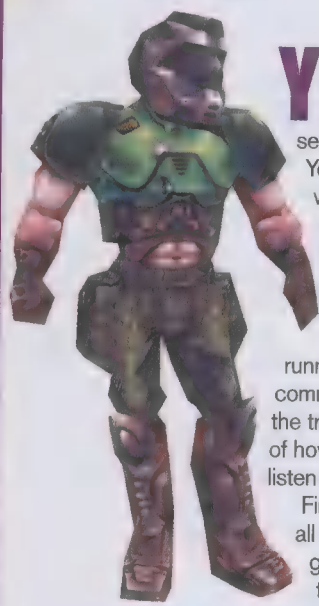
XQF should now be residing in your /usr/local/bin directory. Type **xqf**, and you should be up and running. If you encounter any problems while installing, you can always seek out help at **forums.linuxgames.com**.Okay, take a breather and go grab a Dew from the fridge. You've just installed two applications from the source code. That wasn't hard, was it? Now it's time to find those *Quake III: Arena* servers. If you've used *GameSpy* before, then the interface should look very familiar. From the main *XQF* window select *Quake III: Arena* from the left pane. Yes, we know, they spelled it with a "3" instead of "III" but we'll forgive 'em (this time). On the toolbar at the top of the screen, click **Update** to query the master server. You might want to head back to the fridge for another Dew, since this will take a few minutes. Besides, the additional caffeine will speed up your reflexes and make you a better player to boot (no pun intended). When it's finished, look though the list for a game you like and double-click it to jump into the action.

USEFUL LINKS

quake3.lokigames.com – Loki's official Web site for *Quake III: Arena*. Contains a Frequently Asked Question list that may come in handy if you're having problems.
www.quake3arena.com - id Software's official site for *Quake III: Arena*. Most recent patches can be found here.
www.linuxquake.com - One of the longest-running sites in the Linux gaming scene. Lots of helpful information can be found in the forums.
www.linuxgames.com - Not *Quake III: Arena*-specific but a good all-around Linux gaming site with occasional *Quake III: Arena* news and forums.

penguin got game

DEDICATING A SERVER



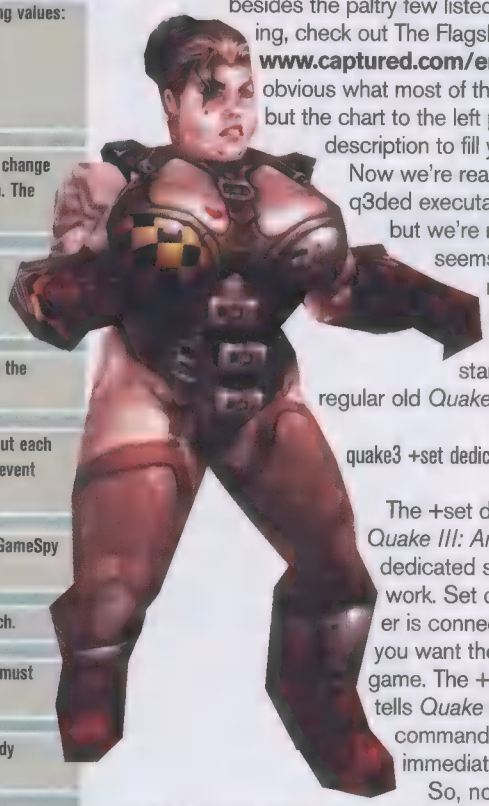
You're one of the privileged few individuals who have been granted a power the likes of which this world has never seen. Yes, you're a server administrator. You've got the hardware and the bandwidth and the right to do whatever you want to with it. So what do you do? Run a *Quake III: Arena* server, of course! Unfortunately, you're going to have to jump through a few hoops to get a decent server up and running. Just typing **q3ded** at the command line certainly isn't going to do the trick. We're here to reveal the mystery of how to run a *Quake III: Arena* server, so listen closely and take notes.

First, we're going to need a file to store all of the options that will make our game run the way we want. Let's call this file server.cfg and place it in the baseq3 directory. Open it up in your favorite text editor and put the following lines in it. We'll explain what it all means later:

```
seta g_maxGameClients 16
seta cl_maxpackets 30
seta sv_hostname "Maximum Carnage"
seta g_motd "Do you feel lucky punk?"
seta g_gametype 0
seta g_allowvote 0
seta g_friendlyFire 0
seta g_weaponrespawn 1
seta fraglimit 30
seta capturelimit 10
seta timelimit 20
map q3dm1
```

These are all of the options that control the basic game play. The map command at the end is the only one that is absolutely required. The server will not properly start unless you tell it what map to load up. This should always be the last command in your server.cfg file. There are many more settings you could use besides the paltry few listed here. For a complete listing, check out The Flagship Engineering Room at **www.captured.com/engr/**. It should be fairly obvious what most of the above settings control, but the chart to the left provides a complete description to fill you in even more.

Variable	Description
g_gametype	Type of game to run. Can be any of the following values: 0: Free-For-All Deathmatch 1: One-On-One Tournament 3: Team Deathmatch 4: Capture the Flag
g_allowvote	Determines whether or not players can vote to change certain server settings like game type and map. The default value of 1 allows voting and 0 will not.
g_friendlyFire	A value of 1 means you can hurt your teammates in team-based modes. If you don't want team members killing each other, set this to 0.
g_maxGameClients	The maximum number of players and observers the server will allow at any one time.
cl_maxpackets	Number of outgoing packets the server sends out each second. Set this to something close to 30 to prevent rate problems with fast clients.
sv_hostname	A friendly name that will identify the server in GameSpy and XQF.
fraglimit	First player to reach the fraglimit wins the match.
capturelimit	In a CTF game, the number of captures a team must get to win the match.
timelimit	The maximum minutes a match will last if nobody reaches the fraglimit for capture limit.
g_motd	A message to display to players when they connect to the server.
g_weaponrespawn	The amount of time that passes before a weapon reappears after it has been picked up. This should be set to a low value (1 or 0) for games with a large number of players.

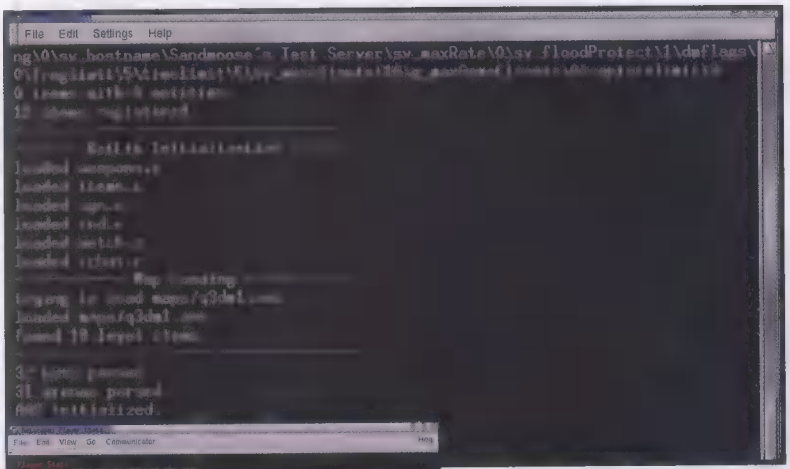


Now we're ready to start the server. The q3ded executable might look enticing, but we're not going to use that. It seems to complain a lot about missing config files—even when you specifically tell it which one to use. Instead, start up the server using the regular old *Quake III: Arena* executable:

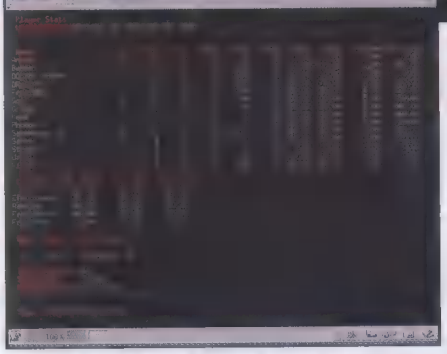
```
quake3 +set dedicated 1  mn+exec server.cfg
```

The +set dedicated 1 parameter tells *Quake III: Arena* that we're running a dedicated server on our local network. Set dedicated to 2 if your server is connected to the Internet and you want the whole world to see your game. The +exec server.cfg parameter tells *Quake III: Arena* to execute the commands in the server.cfg file immediately after starting up.

So, now you have a perfectly good server running, but guess what? When the current match is over, it's going to load the same level again. It seems that *Quake III: Arena* took a step backwards when it came to the simple matter of map rotation. Unless you take special measures, the server will just keep repeating the same level over and over. We don't know about you, but there's no level



Your console window should look like this after successfully starting a server.



The output from Qplog3 gives you all the basic stats you could ever want. Trust us.

we like so much that we'd want to play on it for hours on end. Never fear, though, *Maximum Linux* is here to bail you out of this one. Just replace the map command at the bottom of the server.cfg file with this chuck of code:

```
set map1  "map q3dm1; set nextmap vstr map2"
set map2  "map q3dm2; set nextmap vstr map3"
set map3  "map q3dm3; set nextmap vstr map4"
set map4  "map q3tourney1; set nextmap vstr map5"
set map5  "map q3dm4; set nextmap vstr map6"
set map6  "map q3dm5; set nextmap vstr map7"
set map7  "map q3dm6; set nextmap vstr map8"
set map8  "map q3tourney2; set nextmap vstr map9"
set map9  "map q3dm7; set nextmap vstr map10"
set map10 "map q3dm8; set nextmap vstr map11"
set map11 "map q3dm9; set nextmap vstr map12"
set map12 "map q3tourney3; set nextmap vstr map13"
set map13 "map q3dm10; set nextmap vstr map14"
set map14 "map q3dm11; set nextmap vstr map15"
set map15 "map q3dm12; set nextmap vstr map16"
set map16 "map q3tourney4; set nextmap vstr map17"
set map17 "map q3dm13; set nextmap vstr map18"
set map18 "map q3dm14; set nextmap vstr map19"
set map19 "map q3dm15; set nextmap vstr map20"
set map20 "map q3tourney5; set nextmap vstr map21"
set map21 "map q3dm16; set nextmap vstr map22"
set map22 "map q3dm17; set nextmap vstr map23"
set map23 "map q3dm18; set nextmap vstr map24"
set map24 "map q3dm19; set nextmap vstr map25"
set map25 "map q3tourney6; set nextmap vstr map1"
vstr map1
```

It may seem convoluted, but let's look at what's really going on here. Each line basically sets a string variable. Each string contains two commands. First, load a map, and second, set the nextmap variable. The vstr command takes a string and executes any commands contained within. The last line starts up the server by executing the map1 string. The above chuck of code will cause a server to rotate through the levels in exactly the same order as they appear in the single-player game. Some of these maps may not be appropriate for the number of players you plan on having, so exercise discretion and pick what you think is a good set of maps for the number of players you'll usually have.

THE NUMBERS DON'T LIE

A cool thing you do while running a server is to log the player statistics and post the results on a Web page. Maybe you and your office mates are very competitive, and you want to settle once and for all the debate about who the best fragmeister really is. This is easier to do than you might think.

First, you'll want to make sure *Quake III: Arena* is writing a log file while the server is running. Add a parameter to your startup command so it looks like this (all on one line):

quake3 +set dedicated 1 +set logfile 1 +exec server.cfg

This will cause a file called **games.log** to be created, which contains all of the statistics about who fragged whom. Where is this file? Funny you should ask, since we had to do a bit of searching to find it ourselves. In your home directory should be a hidden directory called **.q3a**. This is where *Quake III: Arena* stores all of its user-specific settings and, in this case, the log files. Look in your .q3a/baseq3 directory, and you should see a games.log file sitting there waiting to be parsed. Which brings us to the next step.

We're going to need a good Perl script to read the log file and produce some human- readable output. Fortunately, a programmer named Michael Q. Le has already done the hard work for us. You can download Qplog3 from **eelinux.com/quake3**. We decided to put our script in the same directory as the log file, just to keep things simple. Give it execute permissions by typing **chmod +x qplog3** at the command line. Now generate your stats by typing **./qplog3 -local -l games.log**. A bunch of lines reading "Generating game stats..." should scroll up on your screen, and the program will end. You should now have a file called "q3stats.html". If you want this file to go in another directory (say, the documents directory for your Web server), then edit the line **$StatFile = 'q3stats'**; to include the path where you want the file written to.

That should cover everything you need to know to run a server. We just can't help you when your boss comes snooping around, wondering where all your server's bandwidth is going...

LINUX LOWDOWN: LILO

YOUR PERSONAL TECH RESOURCE TO MAKE YOUR LINUX EXPERIENCES MORE REWARDING, FULFILLING, AND EXCITING.

Maybe you need to share files. Maybe you aren't weaned from a favorite game. Whatever the reason, the chances are high that you use multiple OSes. If you do, you'll need to choose your OS de jour using a boot manager. LILO (short for Linux Loader) is the boot manager that's included with most Linux distributions. LILO exists because Linux users have a dirty secret: Most of us need another operating system.

Unfortunately, LILO's not pretty and has limited functionality. It can only handle 16 Linux kernels or other OSes, and until recently could not load an OS on a partition beyond a hard drive's 1023 cylinder. With the monster hard drives of today, these limits can be serious. Still, for most people, LILO does the job, and with a few choice tweaks, it can do more than you might think.

-by Bruce Byfield

Scoring a Hat Trick

LILO consists of three parts: /etc/lilo.conf, the configuration file; the lilo command; and the boot prompt. You can configure LILO using the lilo command or make a temporary change at the boot prompt. But the only way to get full control is to open the lilo.conf file to make changes. Even those of you new to Linux should be able to edit lilo.conf without any trouble, provided you take a few basic precautions. If in doubt, be sure to check out the "Under the Hood" sidebar.

Open lilo.conf, and what you'll see are a series of parameters for each OS. Smart code monkeys add lines starting with a hash mark (#) as a guide throughout the file. But, even if lilo.conf has no comments, it is still one of the easiest Linux configuration files to read and follow.

Parameter Posse

LILO parameters are usually equations: a setting with an equal sign that needs to be completed by an option or a file path. A few parameters are statements, forcing LILO to act in a certain way just by being there.

Parameters are divided into groups called stanzas. The lilo.conf file can contain three types of stanzas:

Global: LILO's general properties. The global stanza is always the first in the file.

Kernel: Contains parameters for a Linux kernel. Kernel stanzas start with image=.

Non-Linux: Contains parameters for other OSes. Non-Linux stanzas start with other=.

Other parameters that apply to the OS are defined in the first image= or other= above them. Parameters above the first image= or other= belong to the global stanza.

To see a complete list of parameters, type man lilo.conf at the command line. Meanwhile, here are a few tricks to get you started:

Defining a Default

LILO uses the first stanza after the global parameters as a default. If you don't want to cut'n'paste, you can override this behavior by adding the default= parameter to the global stanza. The default OS starts after the delay defined in the global parameters, or when you press Enter at the LILO prompt.

Starting Selections with a Single Keystroke

Use the "alias" parameter to give an OS another label that's only one letter long. When you press Tab at the LILO prompt, the full labels still display, in case you forget what the alias stands for.

alias=l

Display a Message

To display a special message on boot-up, create a file in a text editor, then enter the path to the saved file in LILO's global stanza using the message parameter. Maybe you'd like to include a "welcome to the system" message? New user instructions? ASCII art? Whatever you choose, the text will display above the LILO prompt.

message=/boot/message

Safe Kernel Hacking

Before upgrading or recompiling the Linux kernel, copy the existing kernel to another file name. For example, let's call it "/boot/oldervmlinuz." Then copy and paste a kernel stanza for the renamed kernel to LILO and change the image and label parameters.

Your old kernel stanza reads:

image=/boot/vmlinuz
label= linux

If everything is well, it will start the upgraded or recompiled kernel. Change the new kernel stanza to:

image=/boot/oldervmlinuz
label=safelinux

Worst case scenario: You can use the kernel stanza labeled "safelinux" to start your machine.

Add Another Security Layer

Drop the password parameter in the global stanza, and you'll need the password to start any OS. Drop it in another stanza, and you need the password only for that OS. Combine the password and restricted parameters, and you won't be able to enter parameters from the LILO prompt. The password won't be encrypted, so change the permissions on lilo.conf so that only the root user can read the file. Determined crackers can bypass the password by booting from a floppy, but, hey, every little bit helps.

password=slithytoves
restricted

LILO Is Not a Virus

Some machines mistake LILO for a boot sector virus when they start. To remedy this, you can either:

Disable virus checking in the BIOS parameters. You can reach the BIOS parameters by pressing the right key combination when your machine starts. (On our machine, it's the Delete key. On your machine, it might be something else.)

or

Install LILO in the root partition instead of the master boot record. Open a command line, and type lilo -- partition.

For the same reason, you might want to disable automatic virus checks in other OSes. Before doing a manual check, you can axe LILO, then reinstall it after the check.

Partitioning Magic

Masters of multiple OSes often use PowerQuest's PartitionMagic to make room on their machines. PartitionMagic is the pioneer of on-the-fly partitioning, but it knocks out LILO when it writes changes to the master boot record, leaving you only able to boot Linux (which isn't really a bad thing). However, you can be back in business by entering lilo at a Linux command line.

LILO Safe Mode

At the LILO prompt, enter a label or alias followed by the single parameter. You'll be taken to the command line, where you can log in as root user for troubleshooting your system.

The 1024 Limit

Older versions of LILO can only start operating systems on partitions that end before the 1024 cylinder of a hard drive. You can't break this limit, but there are a few ways to ease it:

- Install multiple hard drives.
- For a Windows system, create a partition just large enough for the operating system. Place the swap file on another drive, and never install to the "Programs" directory.
- For Linux, create an 8MB partition at the start of the hard drive—the smallest you can create. Mount the partition as /boot, and add the following files:

-map
-bootb
-vmlinuz (the Linux kernel)

You can use the same partition for other kernels or Linux OSes, but make sure that the file names are different and enter them properly in their LILO stanzas.

Handling Hardware

If LILO doesn't recognize your hardware (the PC's, not yours), try these global parameters:

fix-table: Allows LILO to make its own adjustments to hard drive addresses.
linear: Sets LILO to read drive addresses linearly. This parameter is useful with SCSI devices.
disk: Defines partitions using sector/head/cylinder addresses. You can also enter the BIOS code for the device, or make it inaccessible to LILO.
range: Lists the sectors to be read by LILO

```
fixtable
linear
disk=/dev/had
bios=80
image=/dev/hda1
range=1+512
```

Axing LILO

Use either of these options before partitioning:

- To start your machine only with Linux and the present kernel, type lilo --none or lilo -U from the command line.
- To start your machine only with Windows, start from a Windows floppy made when Linux wasn't installed and type fdisk/mbr. Use this option in the unlikely event that you want to get rid of Linux.
- No matter which operating system you keep, you can boot the other one by changing the active partition using fdisk or by using a boot floppy

If you're still using Linux, you can reinstall LILO by typing lilo --mbr or lilo --partition from a Linux prompt.

Start Your Stanzas

Global

boot: LILO's location
map=: The path to LILO's map file. Usually /boot/map.
timeout=: The time before LILO starts the default OS, given in tenths of seconds. (A value of 50 is five seconds.)
prompt: Starts LILO with a command line. Otherwise, you'll have to press the ALT, CTRL, or Tab key.

Kernel

image=: The path to the kernel. Usually /vmlinuz or /boot/vmlinuz.
label =: The name that appears when press the Tab key. This label can be up to 12 characters long. Note: It can't contain spaces.
read-only: The permission for the partition when your machine starts. After system checks at startup, the partition is remounted as read-write.

Non-Linux

other=: The partition that holds the other operating system. Usually, /dev/hda1.
label=: The name that appears when press the Tab key. This label can be up to 12 characters long. Note: It can't contain spaces.
table=: The hard drive that the other operating system is on. Usually, /dev/hda

Editing LILO

You can use a tool such as *Klilo* for editing, but any command line junkie will tell you that these tools are useless for anything except simple changes. Sooner or later, you'll need to tackle lilo.conf yourself. Here's a quick guide:

1. Make a Linux boot floppy.
2. Log in as root user
3. Open /etc/lilo.conf in a text editor.
4. Back up lilo.conf–just in case.
5. Edit lilo.conf in a text editor, then save. Use a # at the start of lines to add guiding comments. You'll be glad later.
6. At a command line, type lilo. The OSes configured in LILO will be displayed something like this:
   Added Windows98
   Added Linux*
   (Note: The star indicates the default entry.)

A Better Boot Manager

Let's face it, nobody's going to call LILO pretty. If you have *Corel* or *Storm Linux*, you get a graphical version of LILO, but there are other choices, too.

System Commander: A commercial, good-looking boot manager. Lets you load up to 99 OSes.
Loadlin: Boots Linux from within DOS. Available with most distributions.
CHoose OS (CHOS): A graphical boot manager starting to appear in some distributions.
GRand Unified Bootloader (GRUB): Widely touted as LILO's successor, GRUB overcomes LILO's limitations.
BootMagic: PowerQuest's graphical boot manager.
IBM boot manager: A text-based bootloader, available with OS/2 (remember that?), or *PartitionMagic* before version 4.0.

Spine-tingling suspense... Shoot outs... Startling revelations...

YES, WE ARE TALKING ABOUT A TRADE SHOW HERE.

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Learning to Love A Lug

I love Linux User Groups. Turning to the Net's archives can satisfy your need for a quick tech fix, but take it from me, nothing but nothing beats a good group brainstorm.

Humans are social by nature. And thanks to Linux's growing acceptance, the stereotypical geeks that everyone ostracized in high school (c'mon, you know who you are) are probably now commanding hefty salaries, putting their geekdom to work (and profit) in some cushy IT jobs. But in order to go from lowly and meek to a high-paid geek, you'll need the help of your fellow Homo sapiens. I've only been using Linux for a relatively short time, but I can't remember a single situation when there wasn't some sort of think tank available when I needed help. It is incredibly scary to even imagine how difficult things would be if we didn't have anywhere to go when something goes wrong.

Of course, your machine may always run just fine, and you can find all the answers you'll ever need on your own. So why should you consider joining a Linux User Group? It's so much better to get help from someone who has gone through a similar problem and has already solved it, than to sit on the phone all day vainly hoping to speak to a real, live tech support person.

Even if tech support were an easy thing to come by (and, trust me, it isn't), I've had very few instances where one person on a telephone tech line could've solved the problems that I've had. Moriarty, my Sony Vaio notebook, totally hated Linux. After trying the install myself about a dozen times, to no avail, I finally surrendered to the inevitable and went to my local LUG—Cabal (short for Consortium of All Bay Area Linux)—to see if anyone else had any solutions or ideas.

Since Moriarty uses a PC Card-based CD-ROM and a USB floppy drive, someone suggested I try the CD-ROM. (Unfortunately, that didn't work.) Neither did loading everything from the floppies. I even tried loading Linux onto an empty part of the Windows partition and doing an install that way. Absolutely nothing seemed to work.

After a long night without success, someone at the LUG meeting suggested I take the hard drive out of my notebook and try hooking it up to a desktop PC to perform the base install. Gutting the notebook scared the bejeebies out of me, and I was fearful that things would go missing or be destroyed. Besides, taking apart Moriarty voided his warranty, prompting some of the more sarcastic LUG members to ask if I still had his original sales receipt. But guess what? At last! Salvation! All in all, it took more than 24 hours, six Linux zealots, and two network engineers to get Moriarty and Debian comfortable with each other. There are some things you just can't do with tech support.

And that was just for my computer. During that LUG install-fest weekend, there were a total of five PCs (and their owners) that needed help getting Linux installed. Of course, each machine—and its respective owners—is unique. Even if every machine were identical, each user has a different way of thinking. And each user has a favorite distro, too. Install-fest days are very intense, but they're also great resources for those who live too far away to come to regular weekly LUG meetings.

So, what do you do if you live in an area where there is no LUG? Start your own! I asked a friend how the largest LUG in my area got going. He said it started with a few people meeting in a local fast food joint. I know another guy who started his LUG at work. There are also different groups to be found at local community colleges. I understand that it may be a bit difficult to find other Linux users (trust me—I come from an area where the cows outnumber the humans), but I know *it is* possible because the LUG that started in a local hamburger joint now has more than 200 members!

Of course, it helps to know at least a couple of other Linux users before you start your own group. Think about what you want to do with this meeting of the minds. It could be as simple as just sitting around talking, or as involved as having your own install-fests on a regular basis. Whatever you decide, you must be consistent in your meeting time. Getting out the word about your existence is the second thing you need to do. Finding a meeting place shouldn't be too difficult. If you don't already have a place in mind, colleges and libraries usually have rooms to spare for free public use, provided that you are quiet, polite, and don't make a mess. Now all you have to do is spread the word.

A newsgroup is a great place to get information about anything you want to know, which doesn't exclude how to find a LUG, or the announcements about the formation of new ones. Try a posting to comp.os.linux.announce, and see what kind of response you get. Word of mouth is also one of the greatest resources you have available.

Osmosis is truly great thing. I've learned most of what I know about Linux from going to meetings. And thanks to my LUG, there are millions of mistakes others have made that I never will.

Linux only exists because people are willing to help each other in a time of crisis. That's the way things started, and I hope this is the way things will always be.

Here are a few links to either help you find a local LUG or start one yourself:

Maximum Linux LUG List
http://www.maximumlinux.com/misc/lugs.php

If you'd like to add your LUG to our list, send an e-mail to lug@maximumlinux.com

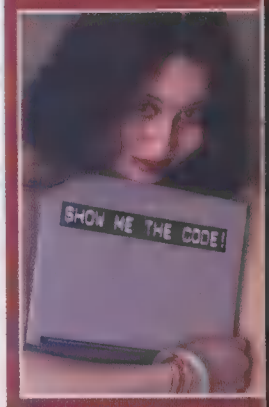
Linux User Groups WorldWide
http://lugww.counter.li.org/

LUG HOWTO
http://www.linux.org/docs/ldp/howto/User-Group-HOWTO.html

Linux Online's Guide to LUGS
http://www.linux.org/groups/

Linux.com's User Group Page
http://www.linux.com/lug/

Groups of Linux Groups Everywhere
http://www2.linuxjournal.com/glue/



Mae Ling is a Linux convert who vows never to go back. She spends her waking moments furthering the cause. If you have a comment about this column or have a cool suggestion for a future topic, please send an e-mail to maeling@maximumlinux.com

The Open ROAD with Bruce Byfield

EXPLORING THE OPEN SOURCE COMMUNITY

Richard Stallman calls it freedom. Old farts in suits mutter about Communism.

Depending on your take, you can call it the Free Software or the Open Source movement. What you can't call it is boring. In less than twenty years, the philosophy behind GNU/Linux has gone from a fringe movement to the software giants' most serious challenge.

Along the way, it's changing how we write software and do business. Some of the ideals of free software are even penetrating marketing. Read the Cluetrain Manifesto (www.cluetrain.com), and you'll see flat organizations and the free exchange of information trumpeted as the latest business techniques. You'll also see names from the Open Source community, like Doc Searls and Eric Raymond.

This column is about free software's assault on the high-tech world. It's also about the troops in the trenches–the coders and idealists behind Raymond, Torvalds, and Stallman–the ones you never hear about. And, in keeping with the Open Source spirit, the column will change with your input. So, send your comments, good or bad, to: opensource@maximumlinux.com, but only after you've read this month's installment

Commence Doc-ing Procedures

The GNU Public License changed how software is released. Now, the GNU Free

Documentation License (FDL) is trying to do the same for books and manuals. You know, those help files and paper stacks that we all use but pretend to ignore.

The FDL is the brainchild of Richard Stallman and Eben Moglen, ■ professor at Columbia Law School. "I had many goals in writing the GNU FDL," Stallman says, "but one specific goal was to encourage commercial publishers to publish commercial-free manuals. The GNU FDL has features that I hope will help them succeed in this business–features designed to give the publishers that pay authors an advantage, without denying anyone the freedoms that all should have."

Like the GPL, the FDL spells out how documents can be copied and revised, but, since the FDL is about docs, it's more complicated than the GPL. Mass copying, covers, and collections are all considered.

The most important condition is the distinction between transparent and opaque works. In order to fully conform with the FDL's guidelines, docs must be "transparent"–readable in free software, and not exported from proprietary software. That means no Adobe Acrobat files, and no *Microsoft Word* files saved as HTML. These docs are "opaque," and, although the FDL covers them, too, the general tendency is to discourage them.

At Slashdot and the Open Software Writer's group (www.oswg.org), debate burst out like pimples on a high-school junior the day before ■ Friday night dance. Will writers want to write free docs, the way that some coders want to develop and write free software? Would a separate doc license give writers more respect? Why not use the GPL? Others pointed out that profit in the Open Source business model comes from services, and, until now, docs have been considered services.

One issue that hasn't been raised is production. Right now, free software just doesn't have the revision power of products such as *FrameMaker*. That means writing takes longer. And, you can't use PostScript or Acrobat. That means trouble with traditional print shops, most of which require these formats.

With so many issues to thrash out, first responses to the FDL are cautious.

MacMillian USA (www.mcp.com), the distributor of *Mandrake Linux*, announced on its Web page that it will use the FDL for "specific products." Similarly, Chuck Toporek, speaking for O'Reilly and Associates, says, "If an author wants to do a book under the FDL, we'll do it." All GNU manuals will be released under the FDL (obviously), and the Free Software Foundation reports that other publishers are also eyeing the license.

The FDL's preamble is right: "Free software needs free documentation." However, in 2000, free documentation seems as new a concept to writers as free software was to coders in 1984. And, so far, the devil seems to be in the details.

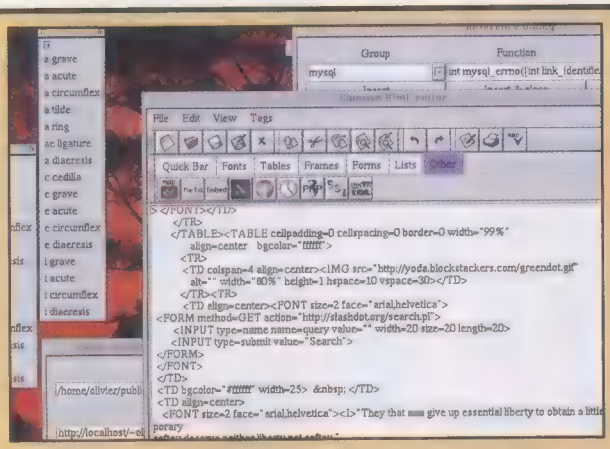
Parting Glances

If you need a sense of how the free software movement is changing the world, then *GNU Parted* (www.gnu.org/software/parted/parted.html) is a good place to begin. It's a typical Open Source project, made possible only by the Internet. Its team is international and idealistic. Key members are under 20. And, like other GNU projects, it's dedicated to making a free alternative to commercial software–in this case, an on-the-fly partitioning tool.

The first bona fide partitioning tool was PowerQuest's *PartitionMagic*. Originally released in the mid-nineties for OS/2, *PartitionMagic* was considered revolutionary, not just because of the convenience of resizing partitions without destroying data, but also because of its platform of origin–which only shows how desperate times were. An IBM product was championed only because it was non-Microsoft. Times changed, and the tool became Windows-only. Now, to the *GNU Parted* team, *PartitionMagic* is just another proprietary tool. Some members of the team won't even look at *PartitionMagic* because they refuse to run software that isn't free.

GNU Parted began with Andrew Clausen, an 18-year-old computer student at the University of Melbourne with a taste for existentialist philosophy and noodling around on the drums and keyboards with his friends. One night in 1998, Clausen spent five hours changing the partitions on a friend's hard drive. "See?" His father told him. "This is why people like Microsoft. It's easy."

Frustrated, Clausen shelved some Open Source sound projects and started work on a tool to resize Window's partitions. Contacts at Red Hat encouraged him to expand the project. Over the Internet, Clausen met Lennert Buytenhek, a contributor to the Linux kernel and now a first-year mathematics and computing student in Holland. Buytenhek was working on a resizer for Linux par-



Bluefish is still a work in progress, but so far, it's worth a major look.

titions, so the two decided to pool their efforts.

A team quickly developed around them, with Clausen as maintainer. Some of the team's efforts found their way into Mandrake's *disk drake* partitioning tool, but seven months and 17,000 lines of code later, the first stable version of *GNU Parted* was released in December 1999.

The hardest part, Clausen says, was learning the details of Microsoft's partition tables and file systems. "Most of how it works isn't documented, so you end up having to support all possible ways of interpreting the system, not just the obvious one," Clausen says. "It's a lot of headaches, and unnecessarily complicated code. For example, there are about 200 lines of code dedicated to detecting BIOS geometry."

In its present form, *GNU Parted* is a command line tool, best used on temporarily unmounted partitions. On Linux, DOS, and Windows partitions, it offers the same functionality as similar commercial tools, at about the same speed.

Clausen is now stomping out bugs in the code and working on support for Windows NT partitions. Another team member, Mathew Wilson of Red Hat, is working on a GUI for the GNOME desktop.

Asked which distributions plan to include GNU Parted, Clausen replies, "Practically all of them." Debian and Connectiva will include *GNU Parted* in their next release. Another half dozen distros are seriously considering it. Clausen says that *GNU Parted* has problems on SuSE (in fact, on one mailing list, there was speculation about GNU Parted being an anti-SuSE conspiracy), but he's hunting them down. Meanwhile, he has a workaround for SuSe users who ask him.

For anyone tempted to ride the Linux rocket, on-the-fly partitioning is a basic need. Before we even consider installing Linux, we usually have to zap or shrink a Windows partition. Taking five hours to prepare with *fdisk* or dropping another $60 on another software box can scare away all except the bravest. Because of *GNU Parted*, making the big switch to Linux is less scary, a lot easier, and even freer than it was before.

TOOL BOX

The Tool Box will be a regular feature of this column. Our goal is to highlight Open Source software that makes Linux easier for your daily work. This month: BLUEFISH.

Red Fish, Bluefish

http://bluefish.openoffice.nl/

Written by Olivier Sessink, *Bluefish* is an HTML editor with a difference. Instead of offering you a WYSIWYG view that shields you from the raw code, like Microsoft's *FrontPage*, *Bluefish* opts for a text view, with icons and menus for adding basic tags and dialogs for defining elements like tables and forms. In other words, it saves time without dumbing down, and always lets you see what you are doing.

Bluefish is so well designed that we were up and running in less than a minute. A quick start guide lets you choose any HTML version from 2.0 to 4.0, as well as color schemes for the page's background, text, and links. Tabs at the top of the window switch the icon bar—including a user-defined one—while tabs at the bottom switch between open pages. The menus include most basic tags (although the paragraph tag is buried in a sub-menu), as well as special characters and attributes for tables and other elements.

The rough edges? On our machine, trying the preview function from the menu crashes *Netscape 6.0*. However, this flaw can easily be overcome by saving the page and opening it directly from a browser. More serious limitations are a lack of site management tools and no means of creating style sheets. Also, although some features suggest support for XML are planned, *Bluefish* sometimes adds unbalanced tags. A paragraph tag, for example, is added without an end tag </p>. While this habit is acceptable in HTML, it causes headaches in XML. For these reasons, *Bluefish* is more useful for the home-user with a simple site than anyone doing serious Web publishing.

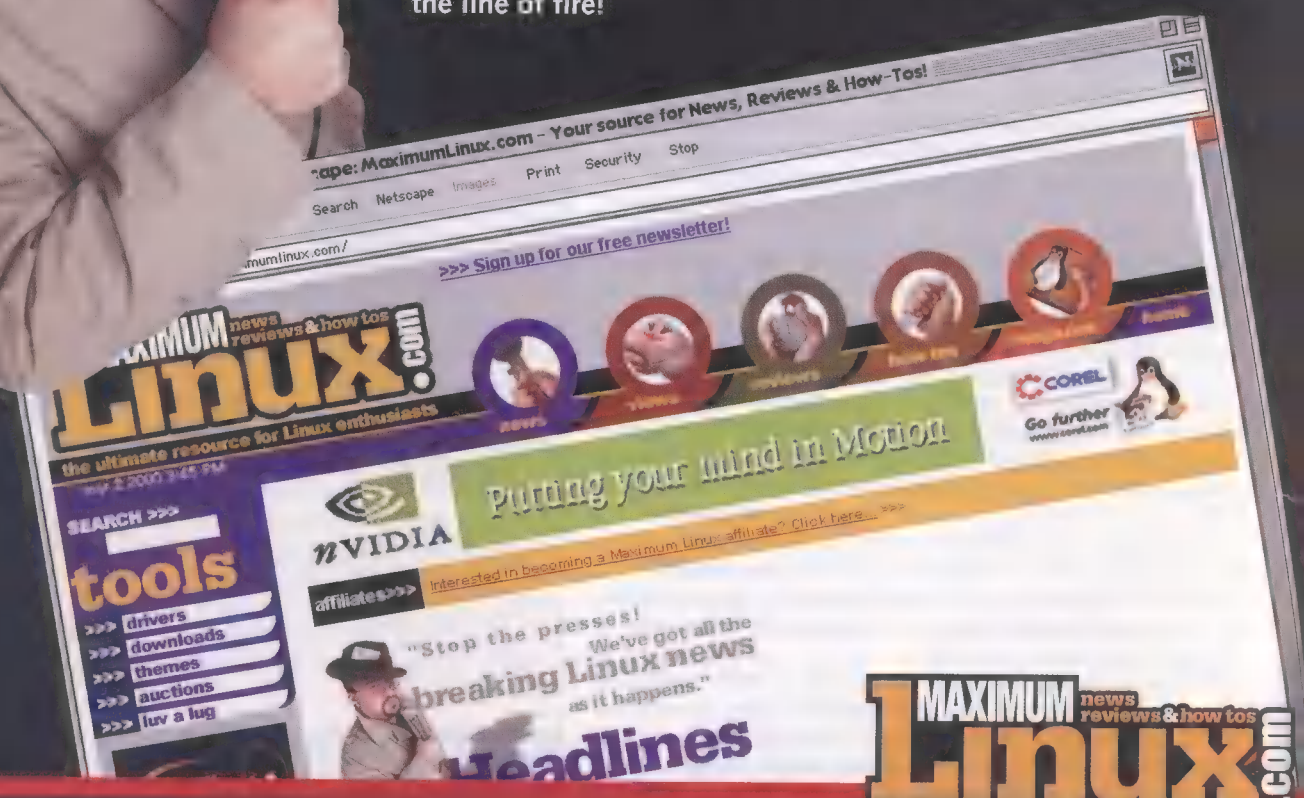
Otherwise, *Bluefish* is useful about 80% of the time. You can't expect more of any GUI. Anyway, like all free software, *Bluefish* is a work in progress. If the improvements we need don't come along, we can always bite the bullet and learn how to add them ourselves.

Maximum Linux Verdict 8

Stop the presses!

Linux Declares WAR!

As Linux opens fire on the evil empire and their bloated operating system, MAXIMUMLINUX.COM is there! With breaking news from the frontlines of the OS wars, we'll send our brave correspondents directly into the line of fire!



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www.maximumlinux.com

loveaLUG

Linux User Groups

Now's your chance to become one with the Linux community!

Listen up, Linux enthusiasts! If you'd like to see your LUG listed here, send an e-mail with your LUG's name, contact information, and Web site (if applicable) to lug@maximumlinux.com. Due to privacy concerns, we will only list contact e-mail addresses when provided–but we will not list any phone numbers. All LUGs listed in the magazine will also be included in our entire database, which can be searched online at www.maximumlinux.com. Please note: *Maximum Linux* magazine cannot be held liable for misinformation provided or any changes that occur after publication, however, we will do our best to maintain any updates online.

Lug Support Program

We're pleased to announce the formation of Maximum Linux's LUG Support Program, which includes, among other things, a reduced group subscription rate for LUG members. If you would like more information on this program, please send a request to lug@maximumlinux.com and we'll let you know the cool details.

California

Simi Valley/Conejo LUG
URL: http://www.sclug.org
Contact: gareth@wiked.org
San Gabriel Valley LUG
URL: http://www.sgvlug.org
Contact: frank@pasadena.net
Linux at LAX LUG
URL: http://www.linuxatlax.org
Contact: ibk@cyberverse.com
UCLA LUG
URL: http://www.linux.ucla.edu/
Contact: admin@linux.ucla.edu

Kansas

Air Capital Linux Users Group
URL: www.aclug.org
Contact: info@aclug.org

Louisiana

Linux Users Group of Lafayette
URL: http://lafix.org
Contact: tim@lafix.org

Maryland

Laurel MD Linux Users Group
URL: http://www.linuxweb.org/lug/
Contact: penguin@linuxweb.org

New Hampshire

Greater New Hampshire Linux Users Group
URL: http://www.gnhlug.org

North Carolina

Greensboro Linux User's Group
Contact: gkitts@techie.com

Ohio

Toledo Area Linux Users Group
URL: http://www.talug.org
Contact: officers@talug.org

Tennessee

Clarksville Linux Users Group
Contact: pccircus@usit.net

Virginia

Peninsula Linux Users Proup
URL: http://www.linuxforum.com/plug/
Contact: hoyt@linuxforum.com
Hampton Roads Linux Users Group
URL: http://hrlug.runlinix.com/
Contact: tintype@exis.net
TideWater Unix Users Group
URL: http://www.twuug.org/
contact: boris@edifax.com

Washington

Greater Seattle Linux User Group
URL: www.gslug.org

Wisconsin

Milwaukee Linux Users Group
URL: http://www.mlug.net/

Canada

Ottawa-Carleton Linux User Group
URL: http://www.oclug.on.ca
Canadian's Linux Users' Exchange
URL: http://global.proximity.on.ca/clue/

Mexico

Grupo de Usarios de Linux
URL: linux.mty.itesm.mx/

Nicaragua, Central America

Grupo de Usuarios de Linux de Nicaragua
Contact: maz@ns.linux.org.ni

LUG OF THE MONTH:

NORTH TEXAS LINUX USERS' GROUP

Currently, about 2000 persons claiming membership; Average monthly meeting attendance is about 150.

WHERE and WHEN: All events are at the offices of Nokia, in Las Colinas (the Dallas suburbs, close to Ft. Worth); For map/directions, see: http://www.ntlug.org/cal/index.html.

Meetings are monthly–the third Saturday morning.

NTLUG's Linux Newbie/ Beginner session is each meeting day at 10 AM; NTLUG'S main members' meeting is at 11 AM.

Geeks and Their Games

I, like many, am sick of Windows. But, what other options do I have? Well, it seems to be either BeOS or Linux. BeOS is for designer freaks, as you know, and I'm definitely not that type, so I'm leaning toward Linux. Okay, since that's settled, I plunged into the Internet to find my copy of Linux. But what is this? Seems to me that Linux has not one, not two, but a horde of different flavors. This is where I need your help. What is the best platform of Linux for a rising computer geek who still wants his hardware and games? Can you help me?

Morgan

Hey, there's no crying in baseball! Never mind. The infamous "Which Distribution is Best?" is probably the most asked question on Linux help channels worldwide. But never fear, dude, the Penguin has the answer for ya. Most people will continue to disagree about which distribution is best because, to put it bluntly, there is no right answer. Try out the new versions of Mandrake and Storm that were included in the last issue of Maximum Linux. Once you do that, move on from there. Try Red Hat, Slackware, or Corel. Sooner or later, you'll stay with one that you like. As for games, Linux is NOT–we repeat, is NOT–a gaming platform. Is it starting to lean toward the gamer in all of us? Sure. But for now, you might want to stick with that handy Windows OS for all of your hardcore gaming needs.

Editing LILO

I was wondering how to edit LILO in order to make Windows my default boot in my dual boot system?

Jeff

Well, Jeff, that's as easy as pie. Add the following line to your /etc/lilo.conf file:

default=<image name>

So that if your lilo.conf file looks like this:

```
other=/dev/hda1
        label=98
        table=/dev/had
```

then the default line would read:

default=98

If you don't use the default line, then whatever image you have listed FIRST in the config file will be the one that boots as default. Ta da!

The Art of Disguise

What file houses the text that prints the operating system when a user Telnets into a machine? I need to comment it out or change it so that my users cannot see which OS I am running, in order to reduce the amount of hack attempts against my machine.

primo@email.com

Since we don't know which distribution you're running, and since all distributions are slightly different, let's use Red Hat as an example. (Mandrake users: This should resemble your distribution as well, since Mandrake is based on Red Hat.) The two files responsible for giving out information to users who connect through Telnet on a Red Hat system are /etc/redhat-release and /etc/rc.d/rc.local. Edit those two files, and you should be set. Most distributions follow the same suit.

Following the Wrong Path

I'm trying to get Sendmail working with Red Hat 5.2. I have O'Reilly's "bat book" on Sendmail, but I am having a problem they don't seem to cover. When I try to run the ./Build command or the ./makesendmail -n command, I get the following:

```
Creating obj.Linux.2.0.36.i586 using
../build tools/OS/Linux
Making dependencies in
obj.Linux.2.0.36.i586
./make sendmail: make: command not
found
Making in obj. Linux.2.0.36.i586
exec:make:not found
```

If you can give me any help at all on this, I'd appreciate it.

Kevin Cobb

Actually, Kevin, it looks as though your path may be screwed up a little bit, or you're trying to compile Sendmail as a regular user. On some Linux distributions, the path is not set correctly for regular users. If you log in as root, will it work then? If not, type the following command:

which make

If it doesn't show the location of make, then either your path is messed up for root, or you may not have installed the make package. That is a big no-no. The binary, 'make', is used to assist in the compilation of every kernel and programs. One sure-fire way to find out if it is to execute the following command:

find /bin /sbin /usr/bin /usr/sbin | grep make

If it doesn't turn up, then it's not installed. If you're using a distribution that uses RPMs, such as Red Hat, TurboLinux, Mandrake, etc., then pop in your CD and install the RPM package for make by executing the following command in the RPM directory on the CD:

rpm -ih make*

Slow Penguin...

My system runs slowly when I am running X (I use the GNOME manager when running X). After all the bragging I did about Linux to my family and friends, I am a little perplexed as to why it is so slow. I remember reading that Linux would run on my toaster, but at this speed, it would probably drive me insane. Can you suggest any tweaks? I would really appreciate it.

Fellow Penguin-Lover

The whole reason why X seems slow is because X requires a lot of memory. When you read that Linux will run on a 386 with 8MB of RAM, or on a toaster, etc., that's because Linux–bare bones–will run on something that small. But when you get into using X and then GNOME as well as Enlightenment or KDE, then the requirements for CPU cycles and RAM shoot up. Way up. You didn't indicate how much memory your PC has, but if it's less than 64MB, we recommend you add some more.

Co-Processors and Linux

I tried to install Linux from the CD in the first issue of Maximum Linux. Since I cannot install it on this computer (as it is used to run an online company and I do not own the computer), I dug out my old 486SX/33MHz. The install went fine. But on boot, the loader tells me I have a 486SX, and it cannot find a math co-processor, and math support is not built-in. Then it tells me it's "giving up."
Do you have any ideas on how to work around this one? Since I like to play with the workings of an OS and break things, I would like to have a machine just for Linux so I do not stress out the boss by playing on the company toys.

Reid

Got a problem with your Linux box? Never fear, the Penguin's here, and he's ready to answer your most pressing Linux questions. From networking to kernel hacks, this is your one-stop shop for tech talk.

Hey! We hear ya there, man. But that's why you tie the boss to his chair and ransom his freedom for Linux...

Anyway, back to the point of your question. You're kind of stuck. You need to get a friend of yours to build a kernel with math emulation support compiled into the kernel. Have him make a bootable disk with the kernel image on the disk. Otherwise, you're gonna have to find a distribution that has math emulation compiled in it as a default.

Beowulf Woof

I've been hearing some things about Beowulf, including its mention in an advertisement on page 95 of your May 00 issue. I understand it's somehow related to Linux, but what exactly is Beowulf–besides the legendary hero of an anonymous Old English epic poem believed to have been composed in the early eighth century?

Dan Golden

Beowulf, or Beowulf Clustering, is actually a way to cluster Linux machines together in order to perform parallel computing. What is parallel computing? It's basically nothing more than using two or more machines together for something such as number crunching. A perfect example would be taking three Linux boxes with two of them being clients and one being a server. You could share a directory called /test using NFS on all three machines. You would then control both clients, from the server, using rsh in a trusted configuration. You wouldn't even need a keyboard on the two clients. We could go into the actual protocols involved when communicating between the machines, but this is a "basic" explanation. In the configuration mentioned above, you have a simple, three-node Beowulf configuration.

Windows Compatibility

Are there any Linux applications that would allow Windows file types to be read by corresponding Linux applications? For example, Microsoft Word can read from and even convert WordPerfect documents into .doc files. Is there anything similar for Linux?

Please allow me to thank you beforehand for any input that you may offer. Oh, yea, I like your magazine.

Neil J. Sleep

We have the solution for you. Corel has just released WordPerfect Office Suite 2000. WordPerfect 9, which is in the suite, has a greatly improved Microsoft Word filter that will keep you reeling on your heels and tapping your toes. Give it a try, and look for a full review in the future right here in Maximum Linux.

Hardware for Linux

My friend and I are building a Linux box from scratch, but before we buy the parts, I wanted to see if you could think of anything that would be missing from our list, or some things that are really recommended.

Here is the list:

- Voodoo3 3000 graphics card
- Red Hat Linux
- Quake III: Arena TIN box
- 17-inch monitor (brand unknown)
- Floppy drive (internal)
- Creative-compatible sound card
- Speakers
- NetGear 10/100T Ethernet PCI card
- 600MHz Athlon with FIC/AMD motherboard
- Computer case (with power supply)
- Maxtor 13.6GB Hard Drive Ultra DMA/66
- 128MB DRAM
- Keyboard
- Mouse
- 52x CD-ROM

It will cost us about $1,200, not including tax. Is there anything you think we forgot?

Steven

The Voodoo is cool, Steve, but dude, why not go with a way cool GeForce card instead? If you're going to smack down $1,200 to the hardware gods, then you might as well throw down a little more for a nicer video card. Besides, it's only about another 100 bucks for a GeForce, anyway. Of course, this all depends on whether nVidia does anything to improve the performance of its drivers under Linux...

The Athlon with an FIC motherboard is a good touch, but don't skimp on the hard drive space. Spring for a 30-gigger. It'll only set you back a couple of Cs at best.

For a nice sound card, you're definitely on track with the Creative line. Stick with the SoundBlaster Live! series, and you'll be fine.

Network card-wise, we'd recommend sticking with 3Com's series of cards. They seem to be the most reliable when it comes to working with Linux.

The Keyboard That Was

I have a stock 486MHz Compaq with 32MB of RAM running Red Hat 5.2. The box is up and running for about 300 days (bless its heart!). It functions as my Web server. Yesterday I noticed that the keyboard connected to that box is not responding. Is there a way to find out which process died and restart it rather than rebooting the whole system?

Paul Kairis

Paul, we feel for ya. Unfortunately, there is no process, per se, that controls your keyboard. There are a few things to consider before you decide to reach for the reset switch. First, has the scroll lock key been pressed inadvertently? If so, this could cause a problem. Second, can you press the scroll lock key on the keyboard to see if it will light up? If so, then your keyboard is fine. If none of that works, then try adding another keyboard to the system. You shouldn't have to reboot. If all else fails, then dude, you're gonna have to reboot. Unless, of course, you want to keep using Telnet and never be able to use the console.

Promises, Promises, Promises

I finally had time to install Linux. I cleared part of my hard drive so that there was a 5GB space with no partition. I ran the install from a boot disk made with the CD. I got to the part were it asked if I have SCSI. I do not. Then it gives me an error saying it cannot find a hard drive. I have a Promise Ultra 66 controller card and a 13GB Maxtor hard drive. Does this mean I can't install Linux with my ATA66 card?

Clyde Robertson

The 2.2.x series of kernels do not have support for Promise's Ultra 66 controller card. You have to patch the 2.2.x kernel to 2.3.3 if you want to get Ultra 66 speeds. The question is, how can you patch the kernel if you can't install Linux? Check out the following URL: www.linux.org/help/ldp/mini/Ultra-DMA-Adventure2 It'll point you in the right direction.

Got a tech problem? E-mail: askthepenguin@maximumlinux.com. Due to the volume of e-mails received, the penguin cannot personally respond to every letter.

TERMinator

Tech Terms Revealed

Technical terms found throughout *Maximum Linux* are underlined and in blue. Can't find what you want here? Check out Terminator online at www.maximumlinux.com.

A

Accelerated-X Accelerated-X and 3D Accelerated-X are graphical servers for Linux and Unix systems. If you're using a high-end 3D video card, such as the Voodoo3 3000 or 3500, you can get special Linux Graphics Drivers for a reasonable fee. If you intend to run Linux on your notebook, Accelerated-X is the best place to start, since the company provides special video drivers for most commercial notebook displays.

Amiga The original Amiga was one of the first personal micro-computers. Currently, Amiga has announced plans to incorporate Sun's Java technology into its software products.

Array A variable that can hold more than one value.

C

CGI Short for Common Gateway Interface, the specification by which an external program interacts with a Web server to create Web pages. CGI is usually used to build dynamic Web pages.

Chomp operation Deletes the last character from a variable if it is a newline (\n) character. Also, what Pac Man does to Inky, Binky, Pinky, and Clyde when they're blinking.

D

Divide and conquer Taking a whole and dividing it into discrete, more manageable portions. This approach is often used by kids along with some guilt-tripping to get exactly what they want.

F

Foreach loop A loop that gets executed one time for each element in an array.

Forms HTML code that specifies areas where a user can enter data.

G

Guile Scheme Guile is an interpreter for the Scheme programming language. Developers use Guile as a packaged library when linking to other programs. Guile allows programmers to extend the functionality of the Scheme language and create scripts tailored to their applications.

H

Hash marks Hash marks, denoted by "######" are symbols you'll normally see if you choose the "–l" option when running RPM. Hash marks are also known as the favorite breakfast meal for die-hard Pittsburgh Steelers fans.

I

Interpreted language As opposed to a compiled language, an interpreted language is compiled "on the fly" each time it is executed.

K

kpackage The default KDE utility to manage RPM packages. It performs the basic install, query, update, and uninstall operations under a graphical interface.

KVM A KVM switch. Short for keyboard, mouse, and video. A device that allows you to share a single keyboard, video display, and mouse between multiple PCs.

L

Lisp A high-level programming language, especially popular for artificial intelligence. Lisp was first developed over 40 years ago. One of its most remarkable features is treating functions as objects that could be assigned to variables or returned from other functions. Lisp can even construct and compile entire new functions at runtime. Many modern languages, including C++ and Java, still lack that capability..

M

Metro-X Metro-X offers, for a fee, an accelerated and enhanced X Server. It provides support for more graphics cards than XFree86 and accommodates special graphical systems, including such things as touch screens. Metro-X also offers its own graphical toolkit and window manager, *Motif Complete!* If you're into high-end 3D, the upcoming *Metro Extreme3D* product will offer the server and video drivers to manage accelerated video cards.

N

NeXTSTEP NeXTSTEP is a complete development and user environment with a unique graphical interface. NeXTSTEP provides several development kits, right out of the box, including: Sound, Indexing, 3D Graphics, Database and Application kits. One special feature of NeXTSTEP is its Display PostScript (DPS) system, which provides 100% What-You-See-Is-What-You-Get (WSYWIG) on every NeXTSTEP system.

O

OpenWindows Sun's version of the standard X Window system. This system is still X-based, but adds the NeWS (display PostScript) server and many other OpenWindows applications. All X applications still run under OpenWindows, using a consistent "look and feel" referred to as OpenLook.

P

Perl Interpreter The program that actually interprets your Perl code. The Perl Interpreter is usually installed in the /usr/bin/perl directory.

Pixmaps Pixmaps are color pictures ending with a .gif or .ppm extension. They are often used to define images for later use in graphic operations. Pixmaps are also used to define tiles or patterns, for use as window backgrounds, borders, or cursors.

Pointer-driven keyboard focus This feature places the keyboard cursor, or keyboard focus, on the window you select using your mouse pointer. There is no need to double-click on the window to gain keyboard focus.

S

Subroutine A named snip of code that can be executed. Typically, you would take the things that you end up typing repeatedly in a program and make a subroutine out of them.

X

XFree86 XFree86 is a freely distributed implementation of the X Window System that runs on UNIX and UNIX-like operating systems such as Linux and OS/2. XFree86 supports a wide variety of commercial video cards and monitor settings. The XFree86 project has focused on Intel-based platforms, but they are in the works of increasing the range of platforms that XFree86 runs on.

X-Files A cool television show starring David Duchovny and Gillian Anderson. At press time, there was rumor that the show would not return for another season next year. As die-hard fans of the show, we'd like to see at least one more season in order to wrap up some of the more complicated story arcs, including the whereabouts of Mulder's sister.

biOS to the Source

Carl Constantine

Carl lives in beautiful Victoria, British Columbia and works as a technical writer for Metrowerks, makers of the CodeWarrior development environment. When not spending time with his wife Terry and three kids, Carl can be found dispensing advice at the Victoria Linux User Group. You can write to him at: carl@maximumlinux.com.

Michael Luton

Michael is an Internet Engineer with Imagine Media's own Daily Radar. He has been working with Unix systems for almost seven years and currently prefers the rich blend of Apache, Oracle, and PHP for most of his Web development work. He does as much gaming as possible on Linux, but laments that Asheron's Call hasn't been ported yet.

Peter J. Salzman

Peter is currently studying General Relativity for his PhD in physics at the University of California and is also the president/founder of the Linux User Group of Davis. In his early years, Peter made it into the Secret Service's top ten-most wanted hacker list, got caught, and turned over a GNU leaf. He spends his free time programming.

Anders Brownworth

Anders maintains the Linux Netatalk-HOWTO, and works for Imagine Media as a Webmaster and systems administrator. Various pro bono projects range from ■ Linux-driven campus wide network to an e-mail system for ■ hospital in Haiti delivered through a satellite telephone. Anders has been working with Linux since 1993. Reach him at anders@maximumlinux.com.

Dean Staff

Dean is the technical writer for Protus IP solutions, a global leader in Internet faxing. Dean's interest in Linux grew from a desire to find an alternative to the "Blue Screen of Death". In his spare time, Dean enjoys playing with both of his children, Allie and Corrie, staring intently at the fish in his aquarium, and tinkering with his Linux box.

Evan Eveland, DC

Doc Eveland is a Chiropractor, reformed phreak, and outstanding geek. He's currently running his office on SuSE, although Slack, OpenBSD, and Debian have done the job at various times. There is no truth to the rumors that his son is hard-wired to an old Commodore 64. You can reach them both at evan@maximumlinux.com.

Josue Batista

Josue currently lives in Pittsburgh, PA and works as an IT Business Analysis Consultant for a major insurance company. He also provides e-Business consulting services using leading Web technologies, including Java, Oracle, and Linux. He also teaches computer and finance courses at the local community college.

Malcolm Dean

Malcolm Dean, Maximum Linux's intrepid reporter, is an IT consultant, author, editor, and screenwriter based in Los Angeles. His first word processor was a DEC PDP-8i mainframe. Malcolm is the grandfather of three healthy humans and six robust felines. He is ready for his shot, Mr. deMille. To contact Malcolm, please send e-mail to: malcolm@maximumlinux.com.

Jason Perlow

Always on the bleeding edge of technology, Jason's on an endless quest to acquire the latest and greatest hardware and software toys. He claims he's just an insatiable uber-geek, but we think he needs a lot of professional help. And fast. He can be reached at jason@maximumlinux.com.

Bruce Byfield

Bruce is a techincal writer and freelance journalist. A recovering academic, he wrote the standard book on the Amercian fantasist, Fritz Leiber. His other fanaticisms include breeding and raising parrots, running long, painful distances, and listening to punk-folk music. If you'd like to reach Bruce, send e-mail to bruce@maximumlinux.com.

David Reynolds

David Reynolds, Mac Addict's Executive Editor, runs a Linux box ■■ a firewall for his home network, which also doubles as ■ Web server. He finds playing around in Telnet sessions oddly interesting and can't wait until Mac OS X (with its BSD underpinnings) is released later this year. E-mail him at dreynolds@macaddict.com.

Scott Locklin

Scott Locklin is a physicist, sysop, and disgruntled government worker who occasionally whores on the side as a UNIX consultant. When he's not torturing atoms in his laboratory or breaking into his boss's computer, he enjoys eating red meat, brewing beer, practicing martial arts, making eyes at Goth girls, and target shooting, preferably all at once.

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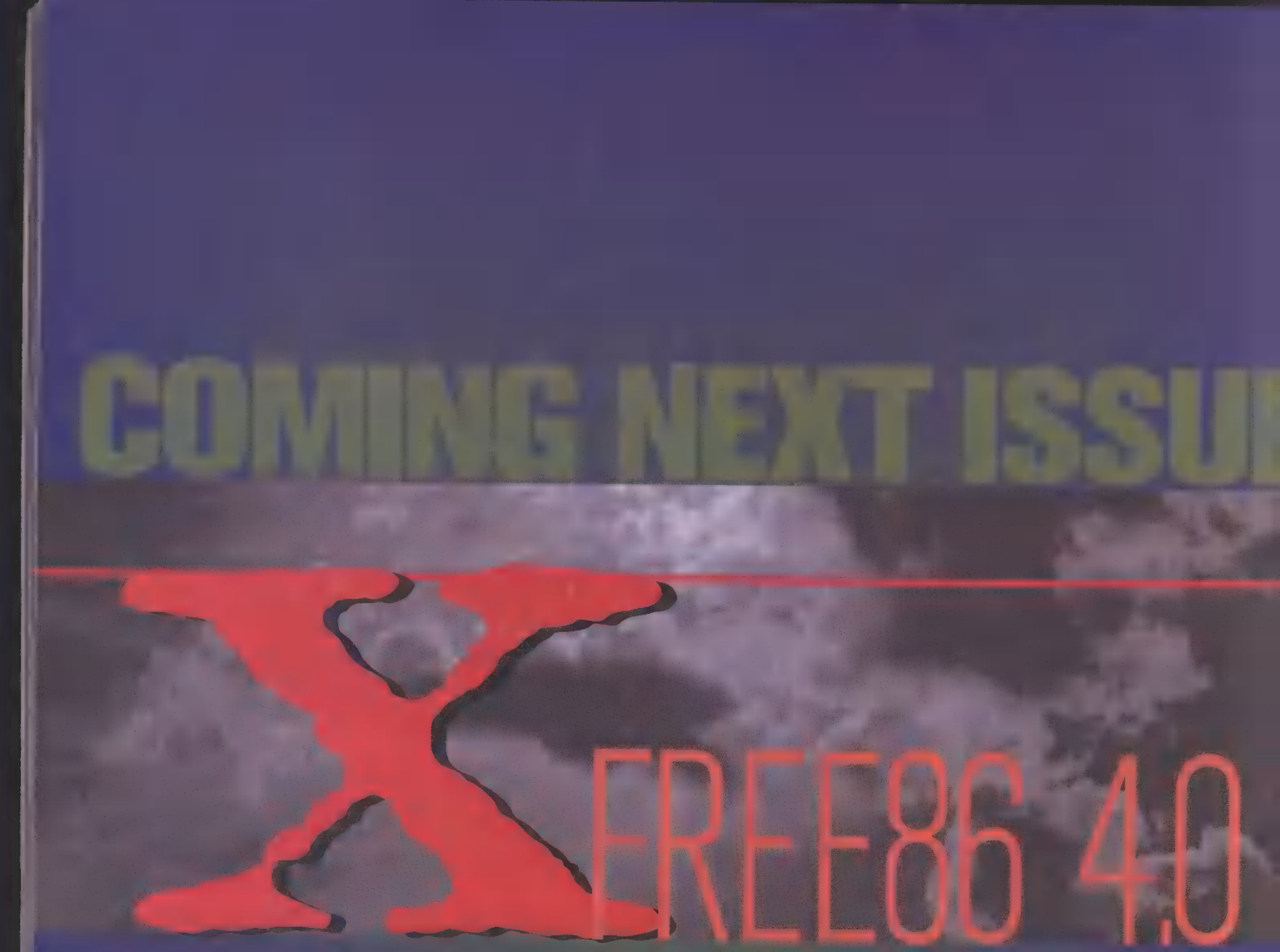

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rants&raves with Colonel X

Do you get tired of hearing people on chat channels whine and complain about who has the greatest flavor of Linux? I do...and it's lame. Or maybe you're fed up with the Windows vs. Linux, Gates vs. Torvalds Royal Rumbles. I know I am. I love the Linux operating system, but damn, enough is enough. I'm a big Linux supporter, but sometimes the Linux world rubs me the wrong way. Got something that bugs the crap out of you? E-mail me at rants@maximumlinux.com and let the penguin feathers fly.

VMWare Did What?!

Big Daddy X decided to check out the *Maximum Linux* Web site the other day, in search of his usual minimum daily requirement of Linux news, when low and behold the X-Man about fainted. Yep, that's right, my extremely loyal Rant followers, Big Daddy just about took the plunge. I could feel my whole face getting hot. I flipped out my groovy *Maximum Linux* pocket mirror and noticed that my face was about to explode in a fiery and bloody state of disbelief.

There it was: "VMware signs OEM Agreement with Microsoft."

Well, well, well. I sure saw this coming a mile away. Back a few months ago, when VMware was in its little 1.0 stage, I happened to do a little investigating of my own concerning the who, what, and why of the management staff. And something very interesting caught my eye. It seems that VMware's co-founder and CEO, Diane Greene, just so happened to be the ex-CEO of VXtreme, a low-bandwidth streaming video company that was acquired by Microsoft in 1997. Interesting connection, no?

The big question that's bugging me is, "What's next?" Why is it that Microsoft always has to insert its grubby little hands into everything? Why? Why can't these people just keep their paws out and leave well enough along? Part of the fun of using VMware is being able to install everything yourself, without the need for any of the pre-packaged, spoon-fed crap. I don't have a problem with making Linux "easier." I don't have any problem with Microsoft per se—I just think its software is bloated like a beached whale. I use Windows. As a matter of fact, I use Windows just as much as I use Linux. I'm just concerned with Bill and his infamous overindulgence when it comes to gobbling up all companies in sight. I do want VMware to continue with its great software and product development, but I'm afraid that this most recent dealing with the devil that seems to be occurring may eventually result in a complete company takeover or something.

VMware is a kick-ass company that's clearly developing kick-ass products, and I hope against hope that nothing will ever stand in the way of their being able to continue to do just that.

> **"VMware is a kick-ass company that's clearly developing kick-ass products. I hope against hope that nothing will ever stand in the way of their being able to continue to do just that."**

Silicon Toys and Mr. Etch-A-Sketch

Do you remember all the hype about Transmeta? I do. And I remember thinking at the time that this was going to be something that was just going to blow my socks off. I mean, I thought the new *Mission Impossible* movie was slick, but I truly believed that Transmeta was going to totally kick some major ass. I was wrong.

In case you haven't heard, Transmeta has released a cute little processor dubbed Crusoe. I suppose it looks kind of tempting as a processor, what with its low-voltage requirements and portability factor, but geez...it's just another chip. There's already way too much competition out there in this arena. This ultra-secret processor design will probably amount to nothing more than a futile attempt to beat Intel at its own game. Of course, Transmeta just landed another 88 million bucks in funding recently, and with support from AOL, Compaq, and Sony, maybe I'll be the one looking like a fool...

Regardless of what happens with Crusoe, Linus is now working on something he calls "The Web Pad." This whole mobile thing has gotten everyone, including Linus, all excited for some reason. Not me. So far, this bad boy looks like a cross between an Etch-A-Sketch on crack and a Nintendo Game Boy. Whether it pans out to be something for us all to marvel over still remains to be seen. Will everyone need one, want one, buy one? We'll have to wait for the answer to that one? The funny thing about all of this is that some people think that this whole "mobile solution" will somehow give us the urge to contact people on the fly. I don't know about you, but there are some people in my life that I'd prefer not to communicate with. Why else do you think I have caller ID and call waiting?

Colonel X is a former Navy Seal and currently works as a private security consultant. In addition to Linux, Colonel X specializes in EOD, psyops, and prisoner interrogations.

The thoughts expressed by Colonel X are entirely his own and may not reflect the opinions of Maximum Linux or Imagine Media, Inc.

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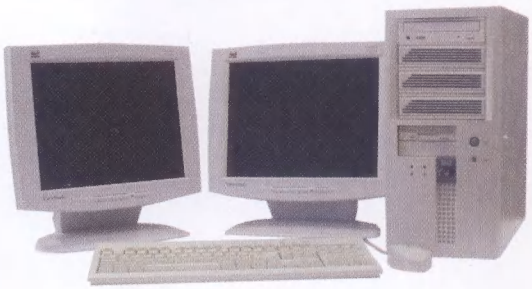

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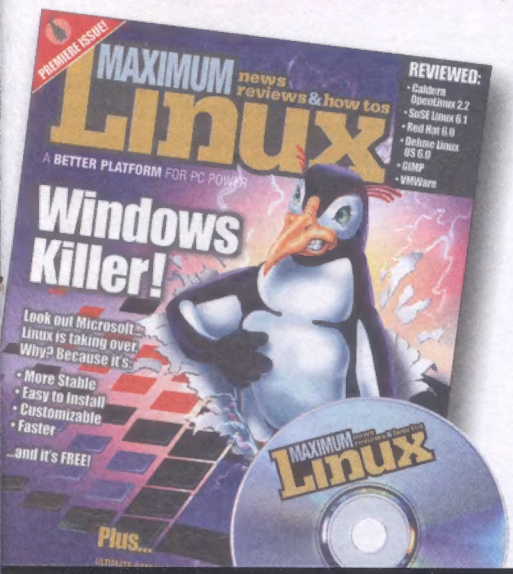

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